TOOELE ARMY DEPOT

Tooele, Utah

Monitoring Well C-45 Completion Report Phase II RFI Groundwater Investigation

Contract Number: GS-10F-0179J

Submitted to:

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Sacramento District

January 2006

Prepared by:

PARSONS and KLEINFELDER

Salt Lake City, Utah

MONITORING WELL C-45 COMPLETION REPORT
PHASE II RFI GROUNDWATER INVESTIGATION
TOOELE ARMY DEPOT
TOOELE, UTAH

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ABBREVIATIONS AND ACRONYMS

µg/L ..... micrograms per liter
API ..... American Petroleum Institute
ASTM ..... American Society for Testing Materials
bgs ..... below ground surface
btoc ..... below top of casing
CTC ..... carbon tetrachloride
ft ..... feet
gpm ..... gallon per minute
IWL ..... Industrial Wastewater Lagoon
MCL ..... maximum contaminant limit
NAD ..... North American Datum
NEB ..... Northeastern Boundary Plume
NGVD ..... National Geodetic Vertical Datum
NTU ..... nephelometric turbidity unit
NPL ..... National Priorities List
PCE ..... tetrachloroethylene
PDB ..... passive diffusion bag
PID ..... photoionization detector
ppm ..... parts per million
PVC ..... polyvinyl chloride
RCRA ..... Resource Conservation and Recovery Act
RFI ..... RCRA Facility Investigation
RPD ..... relative percent difference
STL ..... Severn Trent Laboratories
SWMU ..... Solid Waste Management Unit
TCE ..... trichloroethene
TEAD ..... Tooele Army Depot
UAC ..... Utah Administrative Code
UID ..... Utah Industrial Depot
USACE ..... United States Army Corps of Engineers
USEPA ..... United States Environmental Protection Agency
USCS ..... Unified Soil Classification System
VOA ..... volatile organic analysis
VOC ..... volatile organic compound
WW ..... water well

1. INTRODUCTION

This report contains detailed information regarding the drilling, construction, development, and sampling of groundwater monitoring well C-45, located on Tooele Army Depot, Utah (TEAD). This report was prepared for the US Army Corps of Engineers (USACE), Sacramento District, under Contract GS-10F-0179J, on behalf of TEAD by Kleinfelder, Inc., (Kleinfelder) and Parsons in Salt Lake City, Utah.

TEAD is an active military facility located approximately 35 miles southwest of Salt Lake City, Utah (Figure 1.1) and it has been in operation since 1942. TEAD has been a primary storage, maintenance, and disposal facility for conventional munitions since its inception. Due to impacts to groundwater quality resulting from this activity, TEAD was added to the National Priorities List (NPL) under the federal Superfund program in October 1990.

1.1 BACKGROUND INFORMATION

Historical wastewater discharged to the unlined Industrial Wastewater Lagoon (IWL) at TEAD resulted in a large impacted groundwater plume beneath the eastern portion of the Depot. A large number of monitoring wells, piezometers, extraction wells, and injection wells have defined a trichloroethene (TCE) plume along downgradient, northern, and western extremes of the Depot. This occurrence of impacted groundwater was designated the Main Plume.

In 1986, TCE was detected in an off-site production well located north of the Industrial Area, approximately 5,000 feet (ft) northeast of the IWL. In 1994, well C-10 was installed at the northeastern boundary of the Depot. TCE was detected at a concentration of approximately 240 micrograms per liter (µg/L) in groundwater sampled from well C-10, located directly across the road from the impacted off-site production well (Kleinfelder, 1998).

Additional groundwater investigations were conducted to further assess the nature and extent of groundwater contamination at the northeastern boundary of TEAD. These additional investigations indicated that the contamination in well C-10 and the adjacent off-site production well had likely originated from a source different from that attributed to the Main TCE plume. Thus, two plumes of groundwater contamination were indicated. This second, more easterly plume, was designated the Northeastern Boundary (NEB) Plume. The oil-water separator at Building 679 in the former industrial area (now the privately owned Utah Industrial Depot [UID]) was identified as a major source of this plume (Kleinfelder, 2002).

A subsequent investigation was designed to define the approximate off-site extent of the NEB Plume. The plume, which is relatively narrow beneath the former industrial area, extends

approximately 16,000 ft downgradient (to the north) from the identified source at Building 679 (Parsons, 2003a). The installation of groundwater monitoring well C-45 was conducted in accordance with the Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Solid Waste Management Unit (SWMU) 58 Work Plan (Parsons, 2003b) and Work Plan Sampling and Analysis Plan Addendum 1 (Parsons, 2004) that were approved by the US Army and the State of Utah prior to initiating fieldwork.

1.2 PROJECT PURPOSE AND SCOPE

Monitoring well C-45 is one of fifteen groundwater monitoring wells installed between September 2004 and September 2005 during the Phase II RFI at SWMU 58. SWMU 58 encompasses the source area and the area impacted by the Main and NEB TCE Plumes. Objectives of the groundwater investigative component of the Phase II RFI are to:

- Refine the vertical limits and lateral extent of the Main and NEB chlorinated solvent plumes;
- Further characterize the distribution of contaminants within the plumes
- Ascertain whether there are additional contaminant sources to the NEB Plume and assess their impacts to groundwater;
- Assess the risks to human health associated with the unmanaged (off-site) portion of the NEB Plume; and
- Refine the existing numerical groundwater flow and solute transport models with respect to fate and transport, in order to better predict the potential extent (stability) of the plume in the future.

Investigative efforts described in this completion report were supervised by a Kleinfelder State of Utah-registered geologist who was present for critical on-site activities. Before drilling began, an Excavation Permit was obtained from TEAD, and a permit for well construction was obtained from the State of Utah Division of Water Rights. Copies of the Excavation Permit, Request and Authorization letters, and the Driller's Start Card are included in Appendix A. Underground utility clearance was obtained through Blue Stakes Location Center and UID.

Monitoring well C-45 was drilled, constructed, developed, and sampled between July 20 and August 2, 2005. Drilling and construction activities were conducted by Layne Geoconstruction (Layne) of Salt Lake City, Utah. Following completion of the well, Layne submitted a Well Driller's Report, which is included in Appendix A. Well development and groundwater sampling were completed by Veolia Water North American Operating Services, LLC (Veolia Water), which operates the groundwater treatment plant at TEAD. Laboratory analyses were provided by Severn Trent Laboratories (STL) of West Sacramento, California, which is a State of Utah and a

USACE-certified analytical laboratory. Down-hole geophysical logging was performed by RAS, Inc. (RAS) of Golden, Colorado.

Monitoring well C-45 is located in the NW ¼ of Section 19, T3S, R4W, Salt Lake Base and Meridian within TEAD, about 2,200 ft north of the UID, and about 500 ft west of SR 112. Several objectives were identified to justify the installation of C-45 at this location: 1) better define the centerline of the NEB TCE plume; 2) assess if additional contaminant sources for the NEB Plume are present north of shallow monitoring well C-12 (see Plate C-3 in Appendix C); and 3) further characterize the hydrogeology and VOC contamination of this portion of the NEB Plume. A fourth reason for installation was to quantify, in conjunction with proposed coincident deep monitoring well C-46, the vertical hydraulic gradient of the regional valley fill aquifer at the site (Parsons, 2003b).

2. DRILLING, SAMPLING, AND LOGGING METHODS

2.1 DRILLING

Groundwater monitoring well C-45 was drilled by Layne Geoconstruction of Salt Lake City, Utah, between July 20 and July 22, 2005 using a Becker AP-1000 percussion hammer drilling rig manufactured by Drill Systems. The AP-1000 advances a dual-walled 10-inch diameter drill pipe into the subsurface by means of a diesel-powered pile hammer. Circulating air is pumped down the space between the inner and outer walls of the drill rod to the drill bit, where formation cuttings are picked up and carried back through the center of the drill rod and out of the borehole as the air returns to the ground surface. Cuttings are separated from the discharging air by a cyclone. Dry cuttings were collected and spread on the ground around the well site, whereas saturated cuttings were contained in 55-gallon drums pending analytical results.

2.2 SAMPLING OF DRILL CUTTINGS

Cuttings were observed continuously as they discharged from the cyclone and were collected in 1-quart bags and chip trays. The cuttings were collected and logged at 5-foot intervals or when significant changes in lithology occurred. Drive sampling in previous boreholes during this program was rarely successful due to refusal in coarse sediments and inability to predict where thin, fine-grained layers would occur. Thus, a more accurate and complete borehole log resulted from continuous observation of cuttings from the cyclone.

Drill cuttings were logged using the American Society for Testing Materials (ASTM) Method D2488-00. The Unified Soil Classification System (USCS) was used for designating the various types of unconsolidated material encountered. Where a conflict between the two methods was identified, the ASTM convention took precedence. Color of the drill cuttings (when wetted) was noted by referencing the Munsell color chart system. Estimated percentages of gravel, sands, and fines; degree of roundness and lithology/mineralogy of any gravel clasts; moisture content; degree of cementation; and any other notable attributes were routinely recorded in the sample description. The Becker Hammer Drilling method allows for a maximum clast size of about 6 inches to pass through the drill pipe to the surface. While boulders and cobbles exceeding this dimension may have been encountered over certain intervals, it was generally not possible to identify such zones, let alone estimate the relative percentages of clasts exceeding that size.

Grab samples of drill cuttings from below the saturated zone were logged and screened for volatile organic compounds (VOCs) using an Environmental Instruments photoionization detector (PID). PID readings were also included on the boring log. PID readings from the grab samples from this boring ranged from 0.3 to 2.2 parts per million (ppm). A composite of these samples was submitted for VOC analysis, which was used to determine the proper means of

disposal for all saturated cuttings from this borehole. Saturated drill cuttings were containerized in 55-gallon drums and transported to the UID 90-day yard to await analysis.

2.3 RECORD KEEPING

While on site, Kleinfelder's geologist maintained records of all activities in a bound field log book, on Daily Field Report forms, Drill Rig Inspection forms, Safety Meeting Forms, and Equipment Calibration Logs. Copies of these records are presented in Appendix B.

3. SUMMARY OF SUBSURFACE CONDITIONS

3.1 GEOLOGIC LOG

A Kleinfelder geologist was on-site during drilling and sediment sampling in order to maintain a continuous geologic log of the subsurface conditions that were encountered. Lithologic descriptions and the geologist's observations were entered onto the geologic log. The geologic log of the cuttings that were sampled during drilling of monitoring well C-45 borehole is included in Appendix C as Plate C-1.

The geologic log indicates that the boring was drilled in unconsolidated valley fill sediments from the ground surface to a total depth of 270 ft below ground surface (bgs). The coarser-grained sediments (i.e., gravels) are interpreted to have been deposited in a dynamic high-energy depositional environment of coalescing alluvial fans. They are interpreted to represent one or more of several types of alluvial fan deposits, including debris flow, stream channel, sheetflood, and sieve that have been defined (Collinson, 1978) based on depositional process, location on the fan, deposit morphology, degree of sorting and bedding, etc. Most of the subsurface sediments were poorly graded sand and gravel with varying amounts of boulders, cobbles, silt, and clay. The majority of the coarse-grained sediments consisted of sub-rounded to sub-angular clasts of quartzite and limestone that appeared water-worn. While some angular clasts are observed, these are likely products of the mechanical breaking caused by the drilling method.

Horizons of less permeable fine-grained sediments were encountered at depths of 0-6, 14-17, 82-86, 93-103, 108-112, 117-122, 130-132, 158-162, 202-203, 233-236, and 257-258 ft bgs as indicated on the geologic log. While some of the finer-grained clay- and/or silt-rich sediment occurrences may be of lacustrine or floodplain origin, others may represent debris flows (Collinson, 1978) and/or possibly stream overbank deposits.

The geologic log also indicates that some moderately cemented and strongly cemented zones were also encountered at depths of 156-158, 161-162, 191-194, 203-204, 235-251 (intermittent), and 259-262 ft bgs. No bedrock was encountered during drilling of monitoring well C-45.

Free water from the cyclone was first observed at approximately 235 ft bgs during drilling. The depth to water was measured at 229.62 ft below top of casing (btoc) (226.83 ft bgs) by Veolia Water after the well was constructed and developed. Perched water was not encountered during drilling of monitoring well C-45.

3.2 GEOPHYSICAL LOGS

As a secondary interpretive tool, down-hole geophysical logging of monitoring well C-45 was completed within the polyvinyl chloride (PVC) cased well following construction. Natural gamma ray (gamma) and induction electric (induction) logs were run simultaneously by RAS on September 9, 2005 using a combination gamma ray-induction tool manufactured by Century Geophysical Corporation of Tulsa, Oklahoma. The gamma and induction logs for this well are contained in Appendix C. Data validation was attained via a repeat logging run of a selected stratigraphic interval within the well. On a separate log printout in Appendix C the borehole geology has been added, and an attempt has been made to correlate pronounced gamma and induction electric highs and lows with fine-grained, generally clay-rich units and caliche-cemented zones. The reader should refer to that multipage printout when reviewing the comments presented below concerning the description and interpretation of the geophysical logs.

The gamma logging technique measures the natural gamma emissions emanating from the formation surrounding the borehole. This radiation is released from nuclei of an unstable element decaying to a more stable element. Potassium-40 is the element responsible for most of the gamma radiation detected by the gamma ray probe. This element is very abundant in a number of rock-forming minerals, such as potassium feldspar, that weather to clays. Hence, as the clay content of the sediment increases, the gamma ray response also increases. Thorium- and uranium-bearing minerals also produce a gamma ray response, but in most geologic environments, including the unconsolidated valley fill deposits at the project site, the potassium-40 isotope is most abundant. Conversely, the gamma response becomes progressively weaker as the quartz content of the sediment increases.

A comparison of this and other monitor well boring logs with their respective gamma ray logs shows a very strong correlation between finer-grained, clay-rich units and gamma ray peaks. Typically the interval causing the anomalous geophysical response has been logged slightly lower in the boring relative to said elevated or response. This offset is attributed to an inability to accurately define the depths of unit contacts owing to the time required for the cuttings to travel up the borehole and reach the surface. The measurement scale of the gamma-ray log is in API (American Petroleum Institute) units, accepted as the international reference standard that allows consistent comparisons to be made between a wide variety of gamma-ray counting devices.

The gamma ray response for this well is fairly consistent with the majority of readings falling between 90 and 120 API units. This signature is compatible with the general absence of fine-grained, clay-rich intervals as verified by the geologic log. Several gamma ray peaks of 140 to 170 API units were generated throughout the boring, and correlate with fine-grained silt or clay-rich units noted in the boring log. A series of six lean clay and clayey sand intervals interspersed between 85 and 160 ft correlate directly with gamma peaks of ~130-160 API units. A clayey gravel zone with frequent carbonate cementation zones at 235-250 ft is marked by several

gamma peaks ranging from about 150 to 180 API units. Notably, a thin fat clay zone at 202 ft has no perceptible gamma ray response which may be attributed to clay mineralogy (e.g., a lack of potassium-bearing clay minerals such as illite).

The induction log measures the conductivity from high frequency alternating currents that are induced into the geologic formation. This type of log is best suited where the formation is characterized by low to medium (less than 50 ohm-meters) resistivity values, the geologic medium exhibits medium to high porosity, and the open borehole was advanced using mud or air as the drilling fluid. Induction logging can be performed in boreholes cased with PVC, but not with steel pipe. Although the induction device measures conductivity, by convention the conductivity readings are converted to a resistivity curve when plotted on a down-hole log via a simple inverse relationship.

Three curves are shown on the induction logs that were run by RAS. They represent the direct conductivity (millimhos/meter) readings as designated by a dashed ("cond") curve on the plot, a conductivity ("ap-cond") curve designated by a dotted line that has been corrected for the temperature of the induction probe, and resistivity (ohm-meters) measurements derived from a conversion of the temperature-corrected conductivity readings that are depicted as a solid ("res") line on the induction log plot. Note that although the conductivity and resistivity curves appear to mimic one another, the scales for the two properties are reversed since their relationship is an inverse one.

The resistivity and conductivity curves show a relatively narrow range of values (14 to 16 ohm-meters and about 60 millimhos/meter, respectively) for the coarser-grained (i.e., gravel) intervals, indicating a high degree of homogeneity for those intervals. Because the gravels are volumetrically the most abundant sediment class within this boring, for significant intervals of this boring the resistivity and conductivity curves show little fluctuation. Significant perturbations in the two curves correlate very well with a number of much thinner clay-rich intervals that punctuate the gravels. Because most of the clay-rich zones do not exceed a thickness of 5 ft, the corresponding resistivity lows and conductivity highs are generally represented by rather narrow pronounced peaks. Resistivity lows are generally about 8 to 9 ohm-meters, while the associated conductivity highs are around 90 to 120 millimhos/meter. As noted above, these clay-rich units are also identified by corresponding gamma peaks. Another clay-rich interval is suggested at about 228 ft, based on the induction response at that depth. The one clay zone that lacks a low resistivity/high conductivity signature is the fat clay at about 202 to 205 ft. This same interval had no associated elevated gamma response, further implying a distinct mineralogy.

A number of caliche-cemented zones were logged below 155 ft. The majority of these zones were noted in what appears to be a relatively heterogeneous clayey gravel unit at about 233 to 251 ft bgs, as indicated by the variable gamma and induction electric responses. The lower two-

thirds of this interval, where most of the cementation was observed, has a significantly higher resistivity response relative to the upper third of the unit.

In summary, the induction electric and gamma logs show very good agreement with the subsurface conditions as interpreted from the drilling response and geologic logging of the drill cuttings.

3.3 HYDROSTRATIGRAPHIC SECTION

To aid in understanding the subsurface geology and water table configuration in the vicinity of this monitoring well boring, the geologic log for this well was included on a straight line cross section trending northwest-southeast over a distance of approximately 6,000 ft that is also defined by monitoring wells C-41, C-42F, C-43F, and C-44 (Plate C-4). All of the wells except C-41 were projected onto this section. Projection distances are provided on the cross section. The location of this cross section (A – A') is shown on Plate C-3. Note that only cross section A – A' is provided in this well completion report, since it is the only section that illustrates a simplified stratigraphic strip log of C-45.

Study of the cross section suggests that the predominantly fine-grained sediment units do not appear to be laterally continuous between the five C-series wells that lie on or have been projected onto Cross Section A – A'. Thus, the correlation of these units from borehole to borehole is poor. This is partially due to the substantial distances between them (up to half a mile). However, even for boreholes that are relatively close to each other (e.g., C-41 and C-42F are approximately 800 ft apart), little correlation appears to exist between units.

The difficulty in correlating distinct fine-grained units is not surprising, given that the unconsolidated valley fill within SWMU-58 was largely deposited in a dynamic high energy depositional environment of coalescing alluvial fans. Fine-grained units deposited under such conditions are characterized by limited thickness and areal extent, and this also appears to hold true for the project area, in addition to well boring C-45. Many of the fine-grained silt- and/or clay-rich intervals pinch out over a few hundred feet due to a change in the depositional environment.

Another plausible explanation for limited areal extent is post-depositional erosion and sediment reworking. Channel erosion is strongly suspected of causing the substantial difference in the thickness of a clay-rich lacustrine or floodplain deposit encountered in two closely spaced borings at Building 600 in UID. It almost certainly has been operative elsewhere.

There is another factor that may frustrate correlation of fine-grained units in this and other Phase II RFI groundwater monitoring wells. Most of these fine-grained units, even if they exhibit some lateral extent, were generally deposited on inclined alluvial fan surfaces sloping several

degrees or more. Over a distance of just a few hundred feet, a dip of even a few degrees translates into a change in elevation of up to 10 feet or more. Moreover, for monitoring wells spaced a thousand feet or greater, which is not atypical for the groundwater monitoring array at TEAD, differences in the elevation of a laterally continuous unit could be on the order of several tens of feet.

As per the fine-grained units, little success has been achieved attempting to correlate caliche-cemented zones that occur primarily in the gravels. The same general comments presented above for fine-grained sediment deposits also apply to correlation of cemented zones. The ability to correlate both fine-grained sediment units and cemented zones between monitoring wells in the project area may be contingent upon the quality of the downhole gamma and induction electric logs for those wells.

4. WELL CONSTRUCTION SUMMARY

4.1 CONSTRUCTION TECHNIQUES AND MATERIALS

During drilling of monitoring well C-45, the 10-inch Becker Hammer drive casing was advanced to a depth of approximately 270 ft bgs. Well construction occurred on July 25, 2005. Monitoring well C-45 was constructed inside drive casing and the bottom of the well was tagged at a depth of 269.69 ft bgs. Two 10-foot sections of threaded, 4-inch diameter Schedule 40 PVC well screen with 0.010-inch wide slots and 25 10-foot sections of 4-inch diameter Schedule 40 PVC blank casing were assembled and lowered inside the drive casing to the bottom of the borehole. The screen extends from 249 ft to 269 ft bgs. The well riser consists of 2.79 ft of aboveground blank PVC casing.

Silica sand (16-40) was added to the annulus between the PVC and the borehole in the interval adjacent to the well screen. To help minimize the risk of bridging and to confirm that the correct volume of sand was added, the sand was poured slowly into the annulus from the surface and continuously monitored until the top of the sand interval was approximately 4 ft above the top of the screen. The sand-pack interval was isolated from upper portions of the borehole with a 4-foot thick seal of bentonite clay pellets. The remaining annulus above the bentonite clay pellets was grouted to approximately 30 inches bgs with 30 percent solids bentonite slurry in accordance with Utah Administrative Code (UAC) R655-4-9.4.2. A well construction diagram is provided in Appendix D.

4.2 SURFACE COMPLETION AND SURVEY COORDINATES

The aboveground surface completion was constructed on July 26, 2005. A locking 6-foot long, 10-inch diameter steel protective casing was placed around the uppermost part of the monitoring well casing, with approximately 3 ft above and 3 ft below ground. Concrete was used to partially fill and anchor the protective casing, fill the upper 5 ft of the borehole annulus, and build a 3-foot square by 1-foot thick pad (6 inches above ground surface) around the finished well. The concrete pad was finished to slope away from the protective casing and was embedded with a brass survey monument.

Four 4-inch diameter steel bollards were positioned around the pad to protect it from vehicular traffic. The bollards stand approximately 4 ft above the ground surface and extend about 2 ft bgs into concrete-filled post holes.

Ward Engineering Group of Salt Lake City, Utah, surveyed the well on July 29, 2005. Coordinates for the well locations are referenced to the North American Datum (NAD) 1983

Utah State Plane Central Zone and the elevation to the National Geodetic Vertical Datum (NGVD) 1929. Survey data are included in Appendix D.

5. WELL DEVELOPMENT

Groundwater monitoring well C-45 was developed using swabbing, bailing, and pumping methods on August 1 and August 2, 2005. Development continued for 6 hours and 49 minutes until the turbidity of the water produced was less than five nephelometric turbidity units (NTUs). All development water was collected and contained for later disposal pending analytical results (see Section 7.3). Well development records are included in Appendix E.

5.1 SWABBING AND BAILING

Swabbing and bailing took place for approximately 2 hours and 53 minutes. Swabbing was done with a loose fitting surge block with an oversized rubber disk, slightly smaller than the inner diameter of the screen. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records (Appendix E). Approximately 120 gallons of water were removed from well C-45 by bailing during development.

5.2 PUMPING

After swabbing and bailing the well, development was completed using an electric submersible pump. The pump was lowered to the bottom of the screened interval and operated intermittently at rates ranging from 7.01 to 7.14 gallons per minute (gpm) for approximately 3 hours and 56 minutes. During development pumping, the pump was periodically shut off and the water in the discharge piping was allowed to back-flush (surge) into the well. Pumping and periodic back-flush surging was continued until there was no noticeable increase in the discharge water turbidity. Periodic measurements of pH, temperature, electrical conductivity, turbidity, and comments regarding the appearance of discharge water were recorded on well development records. A total of 1,344 gallons of groundwater were removed by development pumping. The final turbidity was measured at 1.48 NTU.

A total drawdown of 0.18 ft was measured at drawdown equilibrium using a pumping rate of 7.01-7.14 gpm during the final stage of well development (Appendix E). The limited drawdown and the very short pumping time (< 1 minute) required to reach an equilibrium state indicate that the formation at the pump intake (~ 268-269 ft bgs), a poorly graded gravel with sand, has an elevated hydraulic conductivity as would be expected for a unit of this type.

6. GROUNDWATER SAMPLING

6.1 SAMPLING METHODOLOGY

Monitoring well C-45 was sampled using passive diffusion bag (PDB) sampling techniques. PDB sampling is performed without purging and involves lowering a polypropylene bag filled with distilled water to a predetermined depth. Once in place, the water within the PDB sampler is allowed to equilibrate with the surrounding groundwater for 2 weeks. During this time, VOCs diffuse into the distilled water. The PDB sampler is then removed from the well, and water is transferred into three pre-preserved 40 mL volatile organic analysis (VOA) vials.

Four PDB samplers were placed in monitoring well C-45 on September 15, 2005. Two samplers were placed at a depth of 249 ft bgs, one sampler was placed at a depth of 259 ft, and one sampler was placed at a depth of 269 ft bgs. The PDB samplers were retrieved from well C-45 and sampled on October 3, 2005. Groundwater samples collected from well C-45 were assigned sample numbers C-45GW001, C-45FD001, C-45GW002, and C-45GW003.

After the sample containers were filled, they were placed into an ice-chilled cooler and shipped overnight to STL, a State of Utah and USACE-certified analytical laboratory, for VOC analysis. Chain-of-custody forms were filled out and used to document the sampling dates, analytical parameters requested, and proper sample handling. Completed chain-of-custody forms and cooler receipt forms are included in Appendix F.

6.2 GROUNDWATER ANALYTICAL RESULTS

Analysis for VOCs was completed using US Environmental Protection Agency (USEPA) Method 8260B. The highest reported VOC concentrations in the groundwater from C-45 are represented by the TCE values for the primary samples (180-280 µg/L) and the duplicate (190 µg/L) taken at 249 ft bgs. The maximum TCE concentration (280 µg/L) was derived from the uppermost PDB sample. While the field duplicate of that primary sample was only 190 µg/L, it is within the 50% relative percent difference (RPD) acceptance criterion for duplicate samples. The results for the three primary samples indicate a notable decrease in TCE concentration between 249 and 259 ft bgs. Carbon tetrachloride (CTC) was also detected at all three depths, with the highest concentration detected at the same depth as that for TCE. Unlike TCE, there appears to be no statistically significant difference between the CTC values reported for the three primary samples. Chloroform was the only other VOC detected, within the lowermost two PDB sampling depths.

In view of the elevated TCE concentrations reported for this well, it is likely that C-45 is positioned along or very close to the centerline of the NEB Plume. Carbon tetrachloride

concentrations in upgradient wells C-12 (~0.3-2.7 µg/L) and C-13 (~0.3-4.8 µg/L) over the past 2 years are comparable to those reported in C-45. The very low levels of chloroform detected are not unexpected in the presence of CTC at this site.

The sampling results from monitoring well C-45 are summarized in Table 1. Laboratory reports summarizing the results of groundwater analysis from C-45 are included in Appendix F. Also included is an analytical quality control summary describing data quality issues.

TABLE 1

SUMMARY OF LABORATORY RESULTS

TOOELE ARMY DEPOT, UTAH

Analyte	Federal MCL (µg/L) 95 40CFR 141.11, 141.12, 141.61, & 141.62	Analytical Results (µg/L)		
Sample Number & Depth		C-45GW001 (249 ft)	C-45GW002 (259 ft)	C-45GW003 (269 ft)
1,1,1 Trichloroethane	200	ND	ND	ND
1,1,2 Thrichloroethane	5	ND	ND	ND
1,1 Dichloroethane	5	ND	ND	ND
1,1 Dichloroethene		ND	ND	ND
1,2 Dichloroethane	5	ND	ND	ND
1,2 Dichloropropane	5	ND	ND	ND
Benzene	5	ND	ND	ND
Carbon tetrachloride	5	3.4	3.2	3.0
Chloroethane		ND	ND	ND
Chloroform	100	ND	0.35	0.29
cis 1,2 Dichloroethene		ND	ND	ND
Ethylbenzene	700	ND	ND	ND
m,p Xylene	10,000	ND	ND	ND
Methylene chloride	3	ND	ND	ND
Naphthalene		ND	ND	ND
0 Xylene	10,000	ND	ND	ND
Tetrachloroethene		ND	ND	ND
Toluene	1,000	ND	ND	ND
trans 1,2 Dichloroethene		ND	ND	ND
Trichloroethene	5	280	200	180
Vinyl chloride	2	ND	ND	ND

7. INSTALLATION RESTORATION WASTE

7.1 DECONTAMINATION METHODS

To help minimize the chance that non-dedicated equipment could cross-contaminate groundwater or drill cuttings at well C-45, a rigorous decontamination program was followed. A decontamination station was constructed in the temporary UID RCRA 90-day yard (located south of Building 614) that could accommodate the drill rig, drill pipe, and other equipment as needed. Decontamination of equipment was conducted with approved water from TEAD production well WW-3 using a steam cleaner/high-pressure washer. Equipment wash and rinse water were contained in a sump within the decontamination station, and then pumped to a Baker Tank in the UID 90-day yard where it was managed as suspect hazardous waste.

7.2 DISPOSAL OF DRILL CUTTINGS

Sediments from the unsaturated zone were collected below the cyclone in a wheelbarrow and spread evenly on the ground around the well site. Once groundwater was encountered, saturated cuttings were containerized in 55-gallon drums and transported to the UID 90-day yard. An inventory of the suspect hazardous waste drums containing the saturated drill cuttings from this well is presented in Appendix G. An IRW characterization sample of the saturated drill cuttings was collected every 5 ft during drilling. Upon completion of the borehole, these samples were composited to a single sample and submitted to the laboratory for analysis of VOC. Lab results indicated VOCs were not detected in the sediments from C-45. A copy of these results is included in Appendix G.

Disposition recommendations for the non-hazardous saturated drill cuttings were prepared by Parsons in a memorandum to the TEAD Environmental Management Office. TEAD concurred with the recommendations, and directed that the cuttings be returned to the point of generation (well site C-45) and spread on the ground surface (Appendix G). Compliance with this request occurred on October 13, 2005.

7.3 DISPOSAL OF WASTEWATER

Water derived from the drilling of well C-45, including equipment rinse water, was transported from the well site to the UID temporary 90-day yard by Veolia Water using a 1,000-gallon capacity polytank mounted on a dual axle trailer, and then pumped into a 6,500-gallon capacity Baker Tank.

Eventually the water was commingled in a 6,500-gallon capacity Baker Tank (Parsons container #*PARSNZ052080*) with development and equipment rinse water derived from nearby wells C-47F and C-48F. Refer to the drum tracker inventory record for this container in Appendix H.

Commingling of the waste streams from these wells was justified because these three C-series wells lie within the Main Plume. Consequently, for IRW management purposes, it was assumed the development water from these wells would be impacted by chlorinated solvents and have similar waste characteristics.

The Baker Tank (Parsons container #PARS*NZ052080*) was closed and sampled on February 3, 2005. The sample, IDW61, was analyzed for VOCs. The Chains-of-Custody and laboratory report for this sample are presented in Appendix H. This sample contained 48 µg/L TCE, 0.13 µg/L chloroform, 0.31 µg/L naphthalene, and 0.44 µg/L toluene. The waste stream was designated F001 and F005 hazardous in the presence of TCE. The detection of naphthalene and toluene eliminated the TEAD GWTP as the preferred option for treatment/disposal, because that facility is not permitted to treat waste containing detectable amounts of those constituents. Instead, the wastewater was transported to Clean Harbors' Grassy Mountain disposal facility for solidification and landfilling on September 20, 2005. The source(s) of the naphthalene and toluene is unknown. It is speculated that these constituents might have been derived from rinsate generated on the decontamination pad. Copies of the disposal recommendations memo and TEAD's authorization to dispose off-site can be found in Appendix H.

8. REFERENCES

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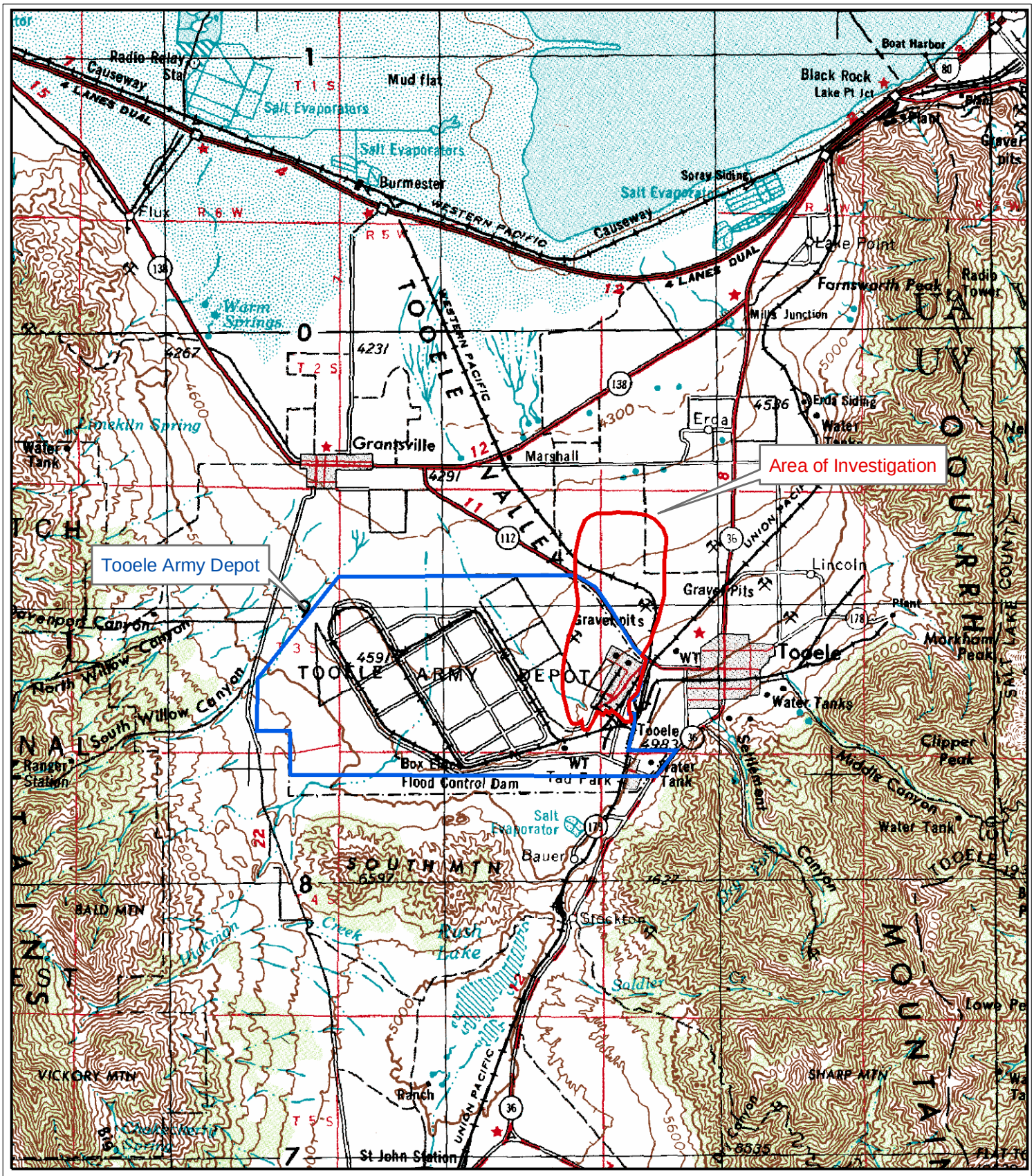
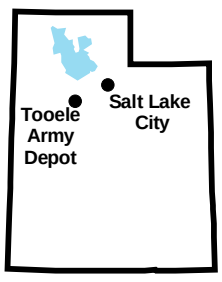


LEGEND

- Installation Boundary
- Investigation Boundary

Source: USGS Tooele, Utah 1 x 2 Quadrangle, 1970



SWMU 58
PHASE II RFI
TOOELE ARMY DEPOT
TOOELE, UTAH

0 1 2 3 Miles

N

FIGURE 1.1
SITE LOCATION MAP

w:\tooele\maps\well_comp_report_sept2005\Loc_Map.mxd 11/28/05

PARSONS

APPENDIX A

APPENDIX A
EXCAVATION PERMIT
(Proponent Agency is Installation Support Division)
(TEAD-R 420-16)

EXCAVATION REQUESTED BY PARSONS/TEAD ENVIRONMENTAL PHONE (801) 572-5999

LOCATION OF EXCAVATION NE CORNER OF OPEN REVETMENT AREA (MAP ATTACHED)

PURPOSE OF EXCAVATION INSTALLATION OF GROUND WATER MONITORING WELL C-45

NAME OF DIRECTOR TO NOTIFY THAT EXCAVATION IS TAKING PLACE IN OR NEAR A BUILDING OR FACILITY UNDER THEIR RESPONSIBILITY N/A
DATE DIRECTOR WAS NOTIFIED

NOTIFICATION SHALL BE MADE 24 HOURS IN ADVANCE

BASED UPON DRAWINGS AVAILABLE AND PERSONAL KNOWLEDGE OF THE AREA FOR WHICH I AM RESPONSIBLE, THE SITE IS FREE OF UNDERGROUND FACILITIES OR SYSTEMS EXCEPT AS NOTED:

REALITY SPECIALIST-BLDG 501 7/13/05

FACILITIES SUPPORT DIVISION-Bldg 516 7-14-15

COMMUNICATIONS CONTRACTOR-Bldg 10 7-14-5 CALL 24 HRS - PRIOR TO DIGGING

COAXIAL CABLE MANAGER-Bldg 10 7/13/05

ENVIRONMENTAL OFFICE-Bldg 8 7-15-05

SAFETY OFFICE-Bldg 400

BLUE STAKES Notification Required YES ___ NO X
Confirmation Number
(For excavations near natural gas lines call BLUE STAKES 2 days prior to the excavation (801) 983-1555. This permit is not valid if yes is checked and the confirmation number is missing.)

INSTALLATION SUPPORT DIV-Bldg 501

NOTE:THIS PERMIT IS TO BE COMPLETED AND ATTACHED TO THE WORK ORDER PRIOR TO THE WORK ORDER BEING ISSUED.

AFTER HOUR EMERGENCIES? CALL 833-2304 or 833-2015

EXCAVATOR MUST HAVE A VALID PERMIT IN POSSESSION BEFORE/DURING EXCAVATION

SMATE Form 2782-R (Rev) Feb 02
(Previous edition obsolete)

Call GSTek (3201/3994) 24 hrs. Before dig start

JOSE LOPEZ

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069 • www.parsons.com

June 23, 2005

State of Utah
Department of Natural Resources
Division of Water Rights
1594 West North Temple
Suite 220
P.O. Box 146300
Salt Lake City, Utah
84114-6300

Attn: Ross Hanson

Subject: Request for authorization to drill a groundwater monitoring well for the Phase II RCRA Facilities Investigation at Tooele Army Depot

Dear Sir:

Parsons, on behalf of Tooele Army Depot (TEAD), requests authorization from the Division of Water Rights (DWR) to drill and install one (1) groundwater monitoring well in Tooele Valley northeast of TEAD and west of Tooele City (see attached table and map figure). Preparations are in progress to drill the well starting on or after June 27th and finishing by July 27th, 2005.

The well boring will be advanced by a State of Utah licensed well driller using percussion hammer drilling to a maximum depth of about 300 ft. As per other C-series monitoring wells constructed during this program, the well will be constructed using four (4) inch diameter Schedule 40 PVC, the well will extend approximately 40 ft below the regional water table, and a 20-ft 10- or 20-slot PVC well screen will be installed over the bottom 20 ft.

If you have any questions or concerns please contact me at (801) 572-5999.

Written authorization should be mailed to Larry McFarland, SJMTE-CS-EO, 1 Tooele Army Depot (Building 8), Tooele, Utah 84074. His work phone is (435) 833-3235.

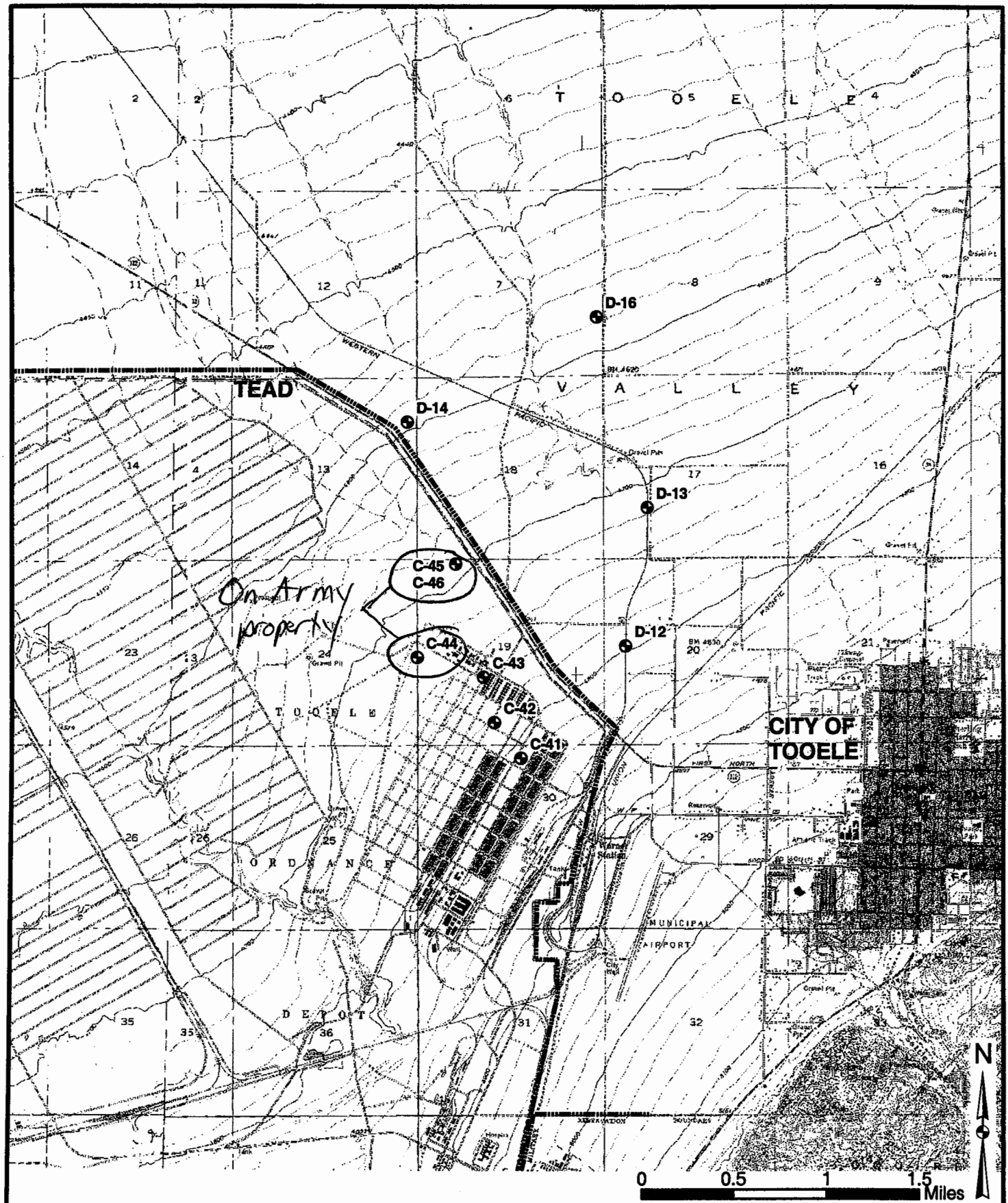
Sincerely,

Richard Jirik, R.G., P.G.
Senior Hydrogeologist
Parsons

LOCATION DATA FOR PROPOSED GROUNDWATER MONITORING WELL C-45
NORTHEAST BOUNDARY AREA
PHASE II RFI @ SWMU 58, TOOELE ARMY DEPOT

	-proposed well location-		-referenced section corner-		-well location relative to section corner-		LAT/LONG								
Well Identifier	State Plane (northing)	State Plane (easting)	State Plane (northing)	State Plane (easting)	North/South Distance (feet)	East/West Distance (feet)	Latitude	Longitude	Section Corner	Section	Township	Range	Base	Diameter (inches)	Depth (feet)
C-45	7370246	1405151	7370371	1404071	South 125	East 1076	40'33"00.54930	112'20"47.80008	NW	19	3S	4W	SL	4	310

The state plane coordinates provided in this table for the proposed monitoring wells were derived from staked locations in the field.
Coordinates were provided by Ward Engineering of SLC.



LEGEND

● PROPOSED GROUNDWATER MONITORING WELL

FIGURE 4.5

PROPOSED GROUNDWATER MONITORING WELLS

TOOELE ARMY DEPOT

w:/tooele/maps/743524/draftmap_for_jeffbigelow.mxd 07/14/03

PARSONS

DIVISION OF WATER RIGHTS
REQUEST FOR NON-PRODUCTION WELL CONSTRUCTION
(for wells deeper than 30 feet)

Well Type (check one): Provisional ( ) Monitor (X) Cathodic Protection ( ) Heat Exchange ( )

Applicants Name: TOOELE ARMY DEPOT

Mailing Address: SIOTE-CO-EO (BLDG 8)

TOOELE ARMY DEPOT TOOELE, UTAH 84074

Contact Person: MR. LARRY McFARLAND Phone: (435) 833-3504

Proposed Start Date: 27 JUNE 2005 Anticipated Completion Date: 27 JULY 2005

Well Drillers License No: 215 Proposed No. of Wells: 1

PROPOSED LOCATION OF WELLS:

County: TOOELE

NO./SQ. DISTANCE (feet)	EAST/WEST DISTANCE (feet)	SECTION CORNER	SECTION	TOWNSHIP	RANGE	BASE	DIAMETER (inches)	DEPTH (feet)
N1000	W1300	W4	15	2S	1W	SL	2	100

Use back of form or additional paper if more room is needed

EXPLANATORY: REFER TO ACCOMPANYING TABLE FOR INFORMATION ON THE PROPOSED WELL.

Richard Jirik
Signature of Applicant

JUNE 23, 2005
Date

FOR OFFICE USE ONLY

Date of Request: _____ *Approval Date:* _____

Approved by: _____ *Provisional/Monitor Well No.* _____

Water Right Number (if available): _____

[redacted] *Request for Non-Production Well* [redacted]

APPLICANT CARD for Monitor WELL#: 0515004M00

IMPORTANT: THIS CARD MUST BE COMPLETED, SIGNED AND RETURNED BY THE WELL OWNER/APPLICANT AS SOON AS THE WELL IS DRILLED BY A LICENSED UTAH WATER WELL DRILLER.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT

MAILING ADDRESS: SIOTE-CO-EO (BLDG 8), TOOELE ARMY DEPOT, TOOELE UT

PHONE NUMBER: 435-833-3504 .

WELL LOCATION: S 125' E 1076' from NW Cor, S19, T3S, R4W, SLB&M.

WELL UTM COORDINATES: Northing: 0 Easting: 0

WELL ACTIVITY: NEW ( ) REPAIR ( ) REPLACE ( ) ABANDON ( )
CLEAN ( ) DEEPEN ( )

WELL COMPLETION DATE: _____

NAME OF DRILLING COMPANY/LICENSEE: _____

Larry McFarland 7-7-05

Owner/Applicant Signature Date

***COMPLETE, SIGN AND RETURN THIS PORTION UPON FINAL WELL COMPLETION - DO NOT GIVE THIS CARD TO LICENSED WELL DRILLER - YOU MUST RETURN IT.

STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

COMMENTS: _____

START/APPLICANT CARD INSTRUCTIONS: First, for each well, you must give a Driller (Start) Card to the licensed driller with whom you contract to construct the well. Second, it is your responsibility to sign and return this Applicant Card to this office immediately after completion of the well. **CAUTION: There may be local health requirements for the actual siting of your well. Please check with the proper local authority before construction begins. See the enclosed sheet addressing construction information.**

DRILLER (START) CARD for Monitor WELL#: 0515004M00

IMPORTANT: THIS CARD MUST BE RECEIVED BY THE DIVISION OF WATER RIGHTS PRIOR TO THE BEGINNING OF WELL CONSTRUCTION -- REQUIRED ONLY FOR WELLS DEEPER THAN 30 FT.

OWNER/APPLICANT NAME: TOOELE ARMY DEPOT
MAILING ADDRESS: SIOTE-CO-EO (BLDG 8), TOOELE ARMY DEPOT, TOOELE UT
PHONE NUMBER: 435-833-3504
WELL LOCATION: S 125' E 1076' from NW Cor. S19, T3S, R4W, SLB&M.
WELL UTM COORDINATES: Northing: 0 Easting: 0
WELL ACTIVITY: NEW (X) REPAIR ( ) REPLACE ( ) ABANDON ( )
CLEAN ( ) DEEPEN ( )

For surface seals in unconsolidated formations (clay, silt, sand, and gravel), will you be using a temporary conductor casing or other formation stabilizer (e.g., drilling mud) in the surface seal interval to maintain the required annular space?

(YES) or NO (Circle one).

Answering 'NO' suggests that you will be placing the surface seal in an open and unstabilized annular space, which may require onsite inspection of seal placement by the State Engineer's Office.

C-15-5 1

PROPOSED START DATE: 7-18-05

PROJECTED COMPLETION DATE: 8-18-05

LICENSE #: 626 LICENSEE/COMPANY: Layne Christensen Company

[signature] 7-15-05

Licensee Signature Date

NOTICE TO APPLICANT: THIS CARD IS TO BE GIVEN TO A UTAH LICENSED WATER WELL DRILLER FOR SUBMITTAL TO THE DIVISION OF WATER RIGHTS PRIOR TO WELL CONSTRUCTION.
STATE OF UTAH DIVISION OF WATER RIGHTS Phone No. 801-538-7416
Fax No. 801-538-7467

COMMENTS:

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 0515004M00 WIN: 34464

Owner *Note any changes*

TOOELE ARMY DEPOT
SIOTE-CO-EO (BLDG 8)
TOOELE ARMY DEPOT
TOOELE UT 84074

Contact Person/Engineer: RIchard Jirik / Parsons

Well Location *Note any changes*

S 125 E 1076 from the NW corner of section 19, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #) C-45

Drillers Activity Start Date: July 18, 2005 Completion Date: September 23 2005

Check all that apply: ☒ New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature of Use: Monitor Well

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	269	9	Percussion Hammer	Air

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, ordor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
0	245						X	X	X					
245	269	X					X	X	X					

Static Water Level

Date July 22, 2005 Water Level 245 feet Flowing? ☐ Yes ☒ No
Method of Water Level Measurement WLI If Flowing, Capped Pressure N/A PSI
Point to Which Water Level Measurement was Referenced Ground Level Elevation N/A
Height of Water Level reference point above ground surface N/A feet Temperature N/A degrees ☐ C ☐ F

Construction Information

DEPTH (feet) FROM	DEPTH (feet) TO	CASING: CASING TYPE AND MATERIAL/GRADE	CASING: WALL THICK (in)	CASING: NOMINAL DIAM. (in)	DEPTH (feet) FROM	DEPTH (feet) TO	SCREEN ☒ PERFORATIONS ☐ OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	249	4" sch. 40 PVC	40	4	249	269	.010	4	Factory Sl

Well Head Configuration: Above Grade Access Port Provided? ☒ Yes ☐ No

Casing Joint Type: Flush Thread Perforator Used: N/A

Was a Surface Seal Installed? ☒ Yes ☐ No Depth of Surface Seal: 245 feet Drive Shoe? ☒ Yes ☐ No

Surface Seal Material Placement Method: Tremie Bentonite Pellets and Bentonite Grout

Was a temporary surface casing used? ☒ Yes ☐ No If yes, depth of casing: 269 feet diameter: 9 inches

DEPTH (feet) FROM	DEPTH (feet) TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	240	Bentonite Grout	48 Bags	50 lbs each
240	245	Bentonite Pellets	2 Buckets	50 lbs each
245	269	16 - 40 Silica Sand	18 Bags	50 lbs each

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One: GPM	Units Check One: CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
	N/A					

Pump (Permanent)

Pump Description: N/A Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____ Well Disinfected upon Completion? ☐ Yes ☐ No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations. and this report is complete and correct to the best of my knowledge and belief.

Name LAYNE CHRISTENSEN COMPANY (Person, Firm or Company - Print or Type) License No. 626

Signature _____ (Licensed Well Driller) Date September 28, 2005

APPENDIX B

7/19/05 Tuesday weather: partly cloudy 85-100°
WWD 10 mph to NW

6:50 I arrive at Parsons field office and get Kurts truck registration and manifest for Larry to review

8:00 Arrive at TGAD main gate. Go in security to procure vehicle passes and visitor badges. Tom & Jake are onsite to permit 5 vehicles (Truck, Rig, pipe truck, Drum truck, auger rig)

9:10 Larry McFarland arrives to authorize us

9:15 We head back to 80-Day. Could not get a pass for Kurts truck without him there

10:06 Crew is decommissioning drill rig. I go to finish Daily quality control reports

11:15 Tom is ready to Mob. Kurt will meet him at 066 gate and lead him to C-45 well location.

11:50 Tom is at gate with his second load. I join him

12:05 Crew forgot wheel barrow. I go get Mark from Violia to let me out to go to 80-Day & get it

12:25 Back at C-45. We have H & S tailgate. Topic Driving rules on Depot. We do rig inspection as well. Crew is still greasing & fueling rig

12:50 When raising head we notice ram for down pressure is hanging free. Threads from ram to drill are stripped. Tom calls Christian at the shop and leaves message. Crew dismantle while waiting for a responce.

13:05 Christian calls. Because of fire danger we are not permitted to do hot work; so crew will haul piston back to town to repair. I head to field office.

13:30 Kurt is shipping IRW. He needs to leave if possible so I will manifest the waste

15:30 I meet MP driver at sheep lane & take him to D-18. We pick up tanker drive it back to gate at sheep lane 7/19/05

7/19/05

16:00 Larry McFarland & Dean Reynolds arrive
Larry signs manifest # P5011 as generator of waste
Driver placards truck & takes manifest
16:10 We arrive at 90 Day & Dean signs manifest
as Facility Operator
Ned Anderson (driver) and I pump water into
Baker tank.
16:50 We leave 90 Day and return tanker to
D-19. I sign load ticket and put hazwaste
sticker on tank so Jeff Hanrahan (Viola)
can begin development in morning.
17:32 Arrive back at field office & do reports &
file manifest
18:20 Leave for the day

W. A. Williams 7/19/05

7/20/05 Wednesday weather: clear 70-80° breeze to

6:52 I arrive at Parsons field office
7:40 I call Tom. He is in 90-Day yard getting drum truck
7:50 We meet at OG6 gate & security lets us on TEAD
8:05 Arrive at rig and have H&S tailgate (C-45)
8:15 We do rig inspection while Tom attatches new tool for ram.
8:25 I call Jeff Hammann at Viola. He is set up to Develope D-19. Tanker with Haz Waste lable is in place.
8:29 Begin Drilling C-45 at surface
10:03 @ 80' crew hooks up auxillary compressor
10:41 @ 120' Tom strokes casing up & down hole to loosen cuttings to avoid getting stuck
11:33 @ 150' we shut down as both motor and head are getting very hot in the 100° heat
12:03 Begin Drilling @ 150
13:26 @ 200' Carl Cole onsite with Bert ? his geologist pa
13:56 @ 220' we shut down for head to cool
14:13 Begin Drilling @ 220' bgs
14:40 240' bgs. Cuttings at 235.5 appeared damp but from 237 to 240 were dry again. I have Drillers pull casing up 6' and I go back to field office for water level meter and PID. I check PID calibration (98.2 on 100 iso)
15:15 Back at site to measure water level. W.L. = 226.6 We shut down to go get secondary containment tank
16:10 Crew is loaded up but due to security issues will wait till morning to return to site. I go to field office and prepare manifest for tank movement from D-19 tomorr Eric Sahm is at field office. I call MP to set up pickup and Larry McFarland and Dean Reynolds as well.
17:15 I do Daily Activity Report and Quality Control Report
17:55 I leave site

7/20/05

7/21/05 Thursday weather: clear (80-105°) slight breeze to NW

7:05 I arrive at Parsons field office
I was unable to access K-Drive last night so I will again attempt to enter Dailey Quality Control RPT
7:50 Tom calls to point out that because he is bringing more drill pipe out he has a new truck and will need to get a vehicle pass for it. He heads to security.
9:20 Tom decides to fill new pipe truck with water because Thursday is our last chance (Today at 12:00)
10:10 Garry Polaski arrive to turn on Water Well 3 pump
11:15 We arrive at 066 gate. Violia (Mark Baer) lets us in
11:30 We have H2S and do rig inspection Topic: Eye safety
11:46 Crew sets up secondary containment while I lable drums and take water level W.L. = 226.1
12:00 Tom drills down to 240' and starts drilling new footage
12:45 @ 254' the head is out of fuel. Take down harness
13:04 Drilling Again
13:38 269' bgs. This is 43' below water table and is total depth. Crew loads drums and cleans out secondary containment tank into 3 more drums (6 total)

Drums - PARSNZ052020I 234-250'
" 02 250'-262'
" 03 262-269'
" 04,05,06 Containment Tank

15:10 We head to 90-Day thru 066
15:30 Drums on palates - Crew leaves for day. I head to Sheep lane
16:00 Ron Porter (MP driver) and I have tanker with D-19 Development water (PARSNZ052010I) at sheep lane Lenny Mafarland & Dean arrive & Sign Manifest P5012
16:10 We arrive at 90-Day. Dean signs as facility operator
16:50 Tanker pumped into Baker tank. I sign load ticket and return to field office to do Daileys.
17:45 Offsite. Go wash truck. Very dusty roads!

7/21/05

7/22/05 Friday weather overcast 75°

6:50 I arrive at Parson field office

7:20 Tom & Jake call as they are approaching OG6 gate I call security and head to gate

7:45 We arrive at C-45 and take another water level W.L = 126.1 as it was yesterday

7:50 We have H&S tailgate Topic: Hammer rig hazards

8:05 Tom and I do a walkaround of the rig and other vehicles onsite

8:20 Crew lays out 25 - 10' pieces of schedule 40 4" PVC with threads and rubber oring seals and 2 - 10' lengths of schedule 40 4" .010 slotted screen. All are covered in plastic. They attatch a 4" bottom cap to a screen section, thread on the second screen section and begin adding the blank sections as they lower the well casing down the borehole

9:05 Well casing touches bottom we lift up several inches so well is in suspension while under construction Tom tags bottom at 269'7".

9:23 Crew begins adding 50 lb bags of 16-40 Colorado Silica We will sand from 269.5 to 245 = 24'. As previously calculated (p.48) one linear foot of annulus (9" borehole/4" has a volume of 0.35 ft^3. 24 x 0.35 = 8.4 ft^3. One bag of sand is approximately 0.5 ft^3 so hole should take 17 bags of sa

11:37 Having added 18 bags of sand we tag top of sand at 245.4 which is 3.6 feet above top of screen. Crew has pulled 20 feet of casing and the 3rd section is halfway out so top of sand is just below the bit. Crew now begins addin Cetco ¼" coated bentonite pellets in 5 gallon buckets.

12:05 After adding 2 buckets top of pellet seal is 240.5' bgs. We will let seal hydrate over weekend and recheck depth Crew cleans up site and lowers head on well for security

12:55 Crew leaves site. I head to field office to check in w/ Richa

14:05 I do weekly 90-Day yard inspection. Carl Cole onsite (15:

15:05 I go back to field office, discuss next weeks plan with Richard. We go look at locations for C-46 & C47

16:05 I leave for SLC office

Matt Lewis 7/22/05

7/25/05 Monday weather: partly cloudy, 70-80 - breeze to NE

7:04 I arrive at Parsons field office. Richard provided me access to the x-Drive friday so I will update last week of Dailey Quality Control Reports

8:05 Tom calls. He is running late and has a new hand (Ricky Smith) so he must go get a badge for him. He will then come here

8:30 Crew arrives at field office. We have H & S tailgate. Ricky had work on this project during C-12 thru C-13 installation so he has read & signed SSHP

8:50 Crew heads to C-215 to begin placing grout slurry interval

9:04 Richard Jirik onsite

11:05 I head to Violia to procure development logs.

11:20 Violia has yet to make copies & I go to C-45 to witness grouting

11:32 I inspect grout plant & rig. Crew is grouting from 240.5' to the surface. $240.54 \times 0.35\ ft^3/ft = 84.1\ ft^3$ (for 9" borehole w/ 4" well annulus as per p48 of this logbook) Manufactor states each bag yields $2.2\ ft^3$ when mixed with 14 gal (30% solids) $84.1\ ft^3 / 2.2\ ft^3/bag = 38.2$ bags

13:40 Crew has completed grouting well to surface using 48 bags of Pure Gold bentonite grout (50 lb bags). We load up to head to Decon rig in 90-Day yard. I stop by Violia for log copies

14:15 We are able to procure water from WW3 and fill both pipe trucks and water wagon

14:50 Before De-conning crew must pump sump of raw water in Decon pad off into Baker Tank

15:50 Crew has deconned but this is more likely impacted groundwater at C-45 so Kurt intends to keep it seperate from the D wells water but has yet to get a Baker tank for it so we pump pad into 2 drums with # PAR2W2052060I and 02 until a tank arrives later.

16:40 Computer at field office is still on the blink and Kurt is using the other so I will do Quality control reports Wednesday. Crew doing surface completion tomorrow so I wont be out. I put I.D. Lables on D-Wells on my way out tonight 17:15. Offsite

7/26/05 Tuesday clear (70-90°)

Crew uses today to do surface completion at C-45, to mob drill rig to the west side of building 615 for monitoring well C-4 installation.

Mitchell Mills 7/26/05

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/19/05

Site: SWMU 58 Arrival Time: 6:50

Team Leader: Richard Jirik Departure Time \Destination: 18:20

Team Members: Matt Ivers Kurt Alloway Weather: p.cloudy 85-100° wind 10 to NW

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-45
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 12:25 People Present Tom Kerns, Jake Smith, MI

Topics Discussed: Driving on Depot

Logbook Book # B07 1503 Page # 154, 155

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N Current Location: Update DITF?: Y / N

Notes: 6:50 Arrive at site for manifest for review 8:00 Arrive at TEAD Security. Tom & Jake & Lawry & I get 6 vehicle permits and 3 visitor badges 10:06 Decon drilling 11:15 Mob 1st load to C-45 11:50 Mob second load 12:25 Have H&S and pre inspection — Discover broken ram on head. Crews dismantles 13:05 Crews heads to shop 15:30 I meet MP to move tanker from D-18 to 90 Day — pump to baker tank 16:50 Return tank to D-19 for development tomorrow 17:32 Arrive at field office 18:20 Leave site

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7 / 20 / 2005

Site: SWMU 58 - TEAD Arrival Time: 6:52

Team Leader: Richard Jirik Departure Time \Destination: 17:55

Team Members: Matt Ivers, Kurt Albaugh Weather: clear 70-90° breeze to NE

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-45
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 8:05 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Safety Harness

Logbook Book # B071503 Page # 156

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N Current Location: Update DITF?: Y / N

Notes: 6:52 Arrive at site field office 7:50 Meet Tom at OG6 8:05 Arrive at C-45 location. Have H&S tailgate 8:15 Inspecting & repair ram. 8:26 Viola is at D-19 developing 8:29 Begin drilling C-45 10:03 80' use auxillary compressor 11:33 Shut down to cool head @ 150' 12:03 Drilling 13:26 200' Carl Cole & friend (Bert) onsite 13:56 Shut down to cool head @ 220' 14:13 Drilling 14:40 240' bgs cuttings dump W.L = 226.6 Shut down to begin pumping. Go for tank. 16:10 Crew will wait till tomorrow because of gate issues 17:15 I begin paperwork 17:55 I leave site

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7 / 21 / 2005

Site: SWMU 58 - TEAD Arrival Time: 7:05

Team Leader: Richard Jirik Departure Time \Destination: 17:45

Team Members: Matt Ivers, Kurt Albaugh Weather: _____

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-45
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 11:30 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Ear Safety & Health

Logbook Book # B071503 Page # 157

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 7:05 Arrive at field office 7:50 Tom brings new H2O/water truck but requires vehicle pass- heads to security 9:20 Get water from WWZ 11:15 Head to OG6 11:30 @ C-45 have H&S and inspect rig & new pipe truck 11:46 Set up to drum cuttings W.L=126.1' bgs 12:09 Begin drilling @ 240' 13:38 269' bgs T.D. 15:10 Take 6 drums to 90 day PARSWZ052020I thru 06 15:30 Head to Sheep Lane 16:00 Manifest Development water D-19 on tanker PARSWZ052010I 16:50 Tanker pumped to Baker Tank. Go to office for paperwork 17:45 Offsite 18:10 Truck washed

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7 / 22 / 2005

Site: SWMU 58 - TEAD Arrival Time: 6:50

Team Leader: Richard Jirik Departure Time \Destination: _____

Team Members: Matt Ivers, Kurt Albaugh Weather: overcast to p.cloudy

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-45
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 7:50 People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: Hammer Rig hazards

Logbook Book # B071503 Page # 158

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 6:50 Arrive at field office 7:20 Enter OG6 7:45 Arrive at C-45 take water level = 126.1' bgs 7:50 H & S tailgate 8:05 Rig inspection 8:20 Begin construction 9:05 Casing in borehole

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7 / 25 / 2005

Site: SWMU 58 - TEAD Arrival Time: 7:05

Team Leader: Richard Jirik Departure Time \Destination: 17:15

Team Members: Matt Ivers, Kurt Albaugh Weather: partly cloudy 70-90° 10 mph to NE

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-45
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time 8:30 People Present Tom Kerr, Jake Smith, Matt Ivers, Ricky Smith

Topics Discussed: New hand orientation

Logbook Book # B071503 Page # 159

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: 7:04 Arrive at field office - update DQC reports 8:30 Crew arrives with new guy - Ricky Smith - badges on way in. H&S tailgate 8:50 Crew goes to C-45 to place slurry. Richard Jirik onsite 11:38 Arrive at c-45 to grout plant inspection 13:40 Grouting completed 14:15 Get water at WW3 15:50 C-45 pipe Decon'd and pumped into 2 drums PARSN20520601 & 02. I put I.D. tables on D-Wells 17:15 offsite

Attachment 1-2

FIELD ACTIVITY REPORT

Project Number/WBS: 744139-20010 Date: 7/26/2005

Site: SWMU 58 - TEAD Arrival Time: 8:00

Team Leader: Richard Jirik Departure Time \Destination: 5:00

Team Members: Matt Ivers, Kurt Albaugh Weather: clear (70-90°)

Purpose: (Attach all appropriate forms)

- ☐ Geophysical Survey
- ☐ Soil Gas Survey
- ☐ Hydropunch
- ☐ Test Pit
- ☐ GPS
- ☐ CPT
- ☐ Other (specify) _____
- ☒ Well Installation C-45
- ☐ Well Development _____
- ☐ Microwell Sampling
- ☐ Monitor Well Sampling
- ☐ Vertical Boring
- ☐ Angle Boring
- ☐ Hand Auger
- ☐ Surface Soil Sampling

Protection Level: ☒ D ☐ C ☐ B ☐ A

Health and Safety Briefing: Time _____ People Present Tom Kerr, Jake Smith, Matt Ivers

Topics Discussed: _____

Logbook Book # B071503 Page # 160

Photos Camera # _____ Roll # _____ Frame # _____

IDW Drums: Purge / Rinse / Soil Drum Number(s): ES

Closed?: Y / N **Current Location:** **Update DITF?: Y / N**

Notes: Crew spends the day Doing surface completion at C-45 and mobilizes rig to west side of 615, site of monitoring Well C-47 I work on well construction Diagrams & other Appendicies items for D-17, D-18, D-19, C-45

Attachment 1-2

HEALTH AND SAFETY BRIEFING C-45

Date: 7 / 19 / 05 Time: 7:45

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. When transporting vehicles to and from
2. Drill site on Tooele Army Depot obey all
3. traffic rules, wear seatbelts and keep
4. speeds down. All vehicles on depot must have
5. current registration, insurance and vehicle
6. pass
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING C-45

Date: 7 / 20 / 05 Time: 8:10

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. When it is necessary to do work on the
2. head that is over 6 feet high always
3. wear a body harness and tail line
4.
5.
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING C-45

Date: 7 / 21 / 05 Time: 11:30

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. Earplugs are cheap. Always use a new set when
2. starting the day or if they have become
3. dirty or flat to avoid ear infection
4.
5.
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING C-45

Date: 7 / 22 / 05 Time: 7:50

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. The hammer rig has many potential hazards
2. Keep fingers clear of the bottom of a suspended
3. pipe. Always stand clear of the exaust hose
4. and cyclone - as pressure builds and then
5. releases violent thrashing of the hose can
6. lead to injury
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

HEALTH AND SAFETY BRIEFING C-45

Date: 7 / 25 / 05 Time: 8:30

Site Health and Safety Officers(s)

ATTENDEES SIGNATURE

1. [signature]	11.
2. [signature]	12.
3. [signature]	13.
4. [signature]	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

AGENDA

1. We have a new hand onsite today
2. 1. Do not smoke outside cab of vehicle
3. 2. Hospital is located on the north end of town
4. on the west side of the site
5.
6.
7.
8.
9.

NOTE: Site specific health and safety (tailgate) briefings will be conducted each morning at the work sites by the field team leader. Briefings will be documented in the field log.

Layne Christensen Company Job Site Safety Audit D-19 & C-45

Date 7/18/05 | Site: TEAD Phase II RFI @ SWMU 58 | Client: USACE

Rig/Crew: Tom Kerns, Jake Smith

Observers: Matt Ivens

Crew Safety/PPE	YES	NO	N/A		YES	NO	N/A
Hard Hat	☑	☐	☐	Safety Glasses	☑	☐	☐
Lifting Belt	☐	☐	☑	Training Certificates	☐	☐	☑
Gloves	☑	☐	☐	Hearing Protection	☑	☐	☐
Safety Shoes	☑	☐	☐	Proper Clothing	☑	☐	☐
Layne Safety Practice Manual	☐	☐	☑	Dust masks/Level C respirators	☑	☐	☐
DOT physical card, CDL and logbooks present and up to date?	☐	☐	☑	Emergency numbers/HASP present and posted?	☑	☐	☐

Comments:

Site Set-up and Safety							
Hole openings covered or tied off?	☐	☐	☑	Timbers and set-up jacks stable?	☑	☐	☐
Anchor guy lines secure, evenly tensioned and flagged?	☐	☐	☑	Mud or circulation pits barricaded or fenced?	☐	☐	☑
Excavation permit (CA) and shoring considerations?	☑	☐	☐	Traveling blocks, widow makers and elevators inspected?	☐	☐	☑
Site clean and organized? Footing?	☑	☐	☐	Bulk fuel stores lined and grounded?	☐	☐	☑
Pipe blocked and sloped from work area?	☑	☐	☐	Correct monitoring equipment present?	☑	☐	☐
Overhead and underground lines identified?	☑	☐	☐	Chemicals stored away from fuel and protected?	☐	☐	☑
Material Safety Data Sheets present?	☐	☐	☑	Warning signs/Exclusion zone posted?	☑	☑	☐

Comments: - INSpect auger rig on 7/18/05 being used to Dig bottom holes
- INSpect Deconned DRILL 7/19/05 prior to Drilling - ram to head threads strip, IN for repair @ 13:00
- Ram repaired and replaced By 8:15 am 7/20/05
- Inspect New Pipe/Water truck, onsite 7/21/05

Rig Safety							
Kill switch operational?	☑	☐	☐	All mast wiring in conduits?	☑	☐	☐
Vehicle pretrip inspection performed and documented?	☐	☐	☑	Seat belts available and used on all equipment?	☐	☐	☑
Fire extinguisher present and charged?	☑	☐	☐	First aid/BBP kit present and stocked?	☑	☐	☐
Danger points color coded?	☐	☐	☑	Controls identified?	☑	☐	☐
Side guardrails on platform rigs?	☐	☐	☑	Ropes and chains in good condition?	☑	☐	☐
Belts and rotating shafts guarded?	☑	☐	☐	All hooks have safety latches?	☑	☐	☐
Cables in good shape, clamps installed properly?	☑	☐	☐	Pressure hoses safety chained at connections?	☑	☐	☐
Good housekeeping in vehicle cabs?	☐	☑	☐	Spill control materials present?	☑	☐	☐

Rig Safety (cont'd.)	YES	NO	N/A		YES	NO	N/A
DOT #53175 and inspection stickers present and up to date?	☐	☐	☑	Bill of lading, HAZMAT CDL and placarding for hazardous materials hauled?	☐	☐	☑
Climbing blocks and body harness installed, available and used?	☑	☐	☐	Heaters and engines vented outdoors and extinguished?	☐	☐	☑

Comments: Decowned Rig and Pipe Truck 7/19/05

Tool and Equipment Safety							
Spinning chains have rope tail?	☐	☑	☐	Safety cans used for gasoline storage?	☑	☐	☐
Tools and slings in good condition?	☑	☐	☐	All generators grounded?	☑	☐	☐
Compressed gas bottles secure and upright?	☐	☐	☑	GFI used and electrical cords in good condition?	☐	☐	☑
Tag lines used on hoisted pipe and equipment?	☐	☑	☐	Check valve at torch/hose connection and hoses in good condition?	☐	☐	☑

Comments:

Employee Training							
Employees instructed on safe equipment use?	☑	☐	☐	Heat stress breaks followed and documented?	☑	☐	☐
Knowledgeable of chemicals on site?	☑	☐	☐	First aid/CPR certified?	☑	☐	☐
Documented tailgate safety meeting before start of work?	☑	☐	☐	Applicable training up to date including respirator fit test, MSHA and/or OSHA.	☑	☐	☐

Comments: Safety Meetings 7/18/05 - Eye hazards 7/19/05 - Driving on Depot 7/20/05 - Climbing Harness 7/21/05 - Ear Safety 7/22/05 - Hammer Rig Hazards 7/25/05 - New Hand Orientation

Confined Space Work							
Confined Space Entry Permit complete?	☐	☐	☑	Gas monitor on site?	☐	☐	☑
Ventilation equipment available?	☐	☐	☑	Body harness and safety line present?	☑	☐	☐

Pump Jobs/Well Rehabilitation/Filters and Vaults							
Lockout/Tagout on electrical controls?	☐	☐	☑	Chemical storage area secure?	☑	☐	☐
PPE for chemicals available?	☑	☐	☐	Water available for flushing chemicals?	☑	☐	☐
Cable spool and in safe position?	☑	☐	☐	Explosives stored and secured properly?	☑	☐	☑
Test pump engine drive shaft guarded?	☐	☐	☑	•			

Comments:

Auditor's Signature Matt Hawes

Driller's Signature Tom Ker

Helper's Signature Jacob A. Smith

Layne Christensen Company Job Site Safety Audit D-19 & C-45

Date 7/18/05 | Site: TEAD Phase II RFI @ SWMU 58 | Client: USACE

Rig/Crew: Tom Kerw, Jake Smith

Observers: Matt Ivers

Crew Safety/PPE	YES	NO	N/A		YES	NO	N/A
Hard Hat	☑	☐	☐	Safety Glasses	☑	☐	☐
Lifting Belt	☐	☐	☑	Training Certificates	☐	☐	☑
Gloves	☑	☐	☐	Hearing Protection	☑	☐	☐
Safety Shoes	☑	☐	☐	Proper Clothing	☑	☐	☐
Layne Safety Practice Manual	☐	☐	☑	Dust masks/Level C respirators	☑	☐	☐
DOT physical card, CDL and logbooks present and up to date?	☐	☐	☑	Emergency numbers/HASP present and posted?	☑	☐	☐

Comments:

Site Set-up and Safety							
Hole openings covered or tied off?	☐	☐	☑	Timbers and set-up jacks stable?	☑	☐	☐
Anchor guy lines secure, evenly tensioned and flagged?	☐	☐	☑	Mud or circulation pits barricaded or fenced?	☐	☐	☑
Excavation permit (CA) and shoring considerations?	☑	☐	☐	Traveling blocks, widow makers and elevators inspected?	☐	☐	☑
Site clean and organized? Footing?	☑	☐	☐	Bulk fuel stores lined and grounded?	☐	☐	☑
Pipe blocked and sloped from work area?	☑	☐	☐	Correct monitoring equipment present?	☑	☐	☐
Overhead and underground lines identified?	☑	☐	☐	Chemicals stored away from fuel and protected?	☐	☐	☑
Material Safety Data Sheets present?	☐	☐	☑	Warning signs/Exclusion zone posted?	☑	☑	☐

Comments: - INSpect auger rig on 7/18/05 being used to dig bottom holes
- INSpect Deconned drill 7/19/05 prior to drilling - ram to head threads strip, IN for repair @ 13:00
- Ram repaired and replaced by 8:15 on 7/20/05
- Inspect New Pipe/Water truck, onsite 7/21/05

Rig Safety							
Kill switch operational?	☑	☐	☐	All mast wiring in conduits?	☑	☐	☐
Vehicle pretrip inspection performed and documented?	☐	☐	☑	Seat belts available and used on all equipment?	☐	☐	☑
Fire extinguisher present and charged?	☑	☐	☐	First aid/BBP kit present and stocked?	☑	☐	☐
Danger points color coded?	☐	☐	☑	Controls identified?	☑	☐	☐
Side guardrails on platform rigs?	☐	☐	☑	Ropes and chains in good condition?	☑	☐	☐
Belts and rotating shafts guarded?	☑	☐	☐	All hooks have safety latches?	☑	☐	☐
Cables in good shape, clamps installed properly?	☑	☐	☐	Pressure hoses safety chained at connections?	☑	☐	☐
Good housekeeping in vehicle cabs?	☐	☑	☐	Spill control materials present?	☑	☐	☐

Rig Safety (cont'd.)	YES	NO	N/A		YES	NO	N/A
DOT #53175 and inspection stickers present and up to date?	☐	☐	☑	Bill of lading, HAZMAT CDL and placarding for hazardous materials hauled?	☐	☐	☑
Climbing blocks and body harness installed, available and used?	☑	☐	☐	Heaters and engines vented outdoors and extinguished?	☐	☐	☑

Comments: Decowned Rig and Pipe Truck 7/19/05

Tool and Equipment Safety							
Spinning chains have rope tail?	☐	☑	☐	Safety cans used for gasoline storage?	☑	☐	☐
Tools and slings in good condition?	☑	☐	☐	All generators groundad?	☑	☐	☐
Compressed gas bottles secure and upright?	☐	☐	☑	GFI used and electrical cords in good condition?	☐	☐	☑
Tag lines usad on hoisted pipe and equipment?	☐	☑	☐	Check valve at torch/hose connection and hoses in good condition?	☐	☐	☑

Comments:

Employee Training							
Employees instructed on safe equipment use?	☑	☐	☐	Heat stress breaks followed and documented?	☑	☐	☐
Knowledgeable of chemicals on site?	☑	☐	☐	First aid/CPR certified?	☑	☐	☐
Documented tailgate safety meeting before start of work?	☑	☐	☐	Applicable training up to date including respirator fit test, MSHA and/or OSHA.	☑	☐	☐

Comments: Safety Meetings 7/18/05 - Eye hazards 7/19/05 - Driving on Depot 7/20/05 - Climbing Harness 7/21/05 - Ear Safety 7/22/05 - Hammer Rig Hazards 7/25/05 - New Hand Orientation

Confined Space Work							
Confined Space Entry Permit complete?	☐	☐	☑	Gas monitor on site?	☐	☐	☑
Ventilation equipment available?	☐	☐	☑	Body harness and safety line present?	☑	☐	☐

Pump Jobs/Well Rehabilitation/Filters and Vaults							
Lockout/Tagout on electrical controls?	☐	☐	☑	Chemical storage area secure?	☑	☐	☐
PPE for chemicals available?	☑	☐	☐	Water available for flushing chemicals?	☑	☐	☐
Cable spool and in safe position?	☑	☐	☐	Explosives stored and secured properly?	☑	☐	☑
Test pump engine drive shaft guarded?	☐	☐	☑				

Comments:

Auditor's Signature Matt Lowe

Driller's Signature Tom Ker

Helper's Signature Joseph Smith

EQUIPMENT CALIBRATION LOG

Tooele Army Depot

Phase II RFI @ SWMU 58

Eqpt. Type PID	Serial No.	Date	Calibration Time	Calibration Gas	Calibration Gas Lot No.	Calibrated By:	Comments
MWI RAE2000	9296	6/29/05	9:25	100 ppm isobutelyne	82617-117	Matt Ivers	Monitoring well D-17
"	"	7/6/05	7:50	"	"	"	" D-18
"	"	7/14/05	8:10	"	"	"	" D-19
"	"	7/20/05	14:40	"	"	"	" C-45
"	"	7/28/05	10:40	"	"	"	" C-48f
"	"	7/29/05	7:30	"	"	"	" "
"	"	8/1/05	8:30	"	"	"	" "
"	"	8/5/05	8:05	"	"	"	" C-47f
"	"	8/8/05	8:25	"	"	"	" "
"	"	8/9/05	8:38	"	"	"	" "
"	"	9/20/05	8:50	"	"	"	" C-49

Attachment 7-1

APPENDIX C

DRILLING LOG | DIVISION: Sacramento | INSTALLATION: Tooele Army Depot | SHEET 1 OF 7 SHEETS

1. PROJECT: Phase II RFI @ SWMU 58
2. LOCATION (Coordinates or Station): 7370229.15 N 1405164.18 E
3. DRILLING AGENCY: Layne Geoconstruction
4. HOLE NO. (As shown on drawing title and file number): C-45
5. NAME OF DRILLER: Tom Kern / Jake Smith
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 269'
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 269'
10. SIZE AND TYPE OF BIT: 9" O.D 6" I.D
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Drill Systems AP1000 Becker Hammer
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 58 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: 229.62' bgs 8/1/05
16. DATE HOLE: STARTED 7/20/05 | COMPLETED 7/25/05
17. ELEVATION TOP OF ~~BOCE~~ casing 4689.99'
18. ~~TOTAL CORE RECOVERY FOR BORING~~ ground 4687.20'
19. SIGNATURE OF INSPECTOR: [signature]

TIME (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	RECOVERY LOCATION (e)	SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
8:29	0		Lean Clay (CL), medium plasticity, trace fine gravel Dark brown, 7.5YR3/3, moist weak reaction to HCL, with roots	☒	1	Penetration Because the Becker Hammer Drilling Method allows a maximum clast size of about 6 inches to get to the surface, percentages of boulders, cobbles and gravel are speculative
	2					
	4			☒	2	
	6		Well graded gravel with sand (GW) 80% cobble or gravel, angular to subrounded, fine to coarse, 20% fine to med grain sand, gray 10YR 6/1, Dry, strong reaction to HCL			
	8					
8:38	10			☒	3	0.9 min/ft
8:45	12					While clasts range from angular to rounded, many angular clast are likely created by the drilling process so as long as some waterworn clasts are observe in samples, bedrock will not be indicated
	14		- up to 30% reddish brown (5YR4/4) clay in the gravel no sand			
	16			☒	4	
	18		- Silty Gravel with sand (GM) 60% gravel, a to sr f to c, 20% fine to med sand, 20% silt non plastic grey (2.5Y 6/1), Dry, strong reaction to HCL			1.1 min/ft
8:56	20			☒	5	Unless otherwize indicated, rock type represented in the cuttings consists of primarily varying percentages of tan to gray quartzite and gray to dark gray limestone and Dolomite, with trace amounts of yellow brown sandstone Multicolored volcanics and a white silicate mineral
9:09	22					
	24		- Well Graded Gravel with Sand as at 6' except brown 10YR 5/3			
	26			☒	6	
	28					
9:18	30					1.0 min/ft

PROJECT: TEAD Phase II RFI SWM058 | HOLE NO.: C-45 | SIGNATURE OF INSPECTOR: [signature] | DATE: 7/28/05 | PAGE: 2 of 7

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
9:21	32		Well graded gravel with sand (GW), 60% cobble + gravel, A to SR, f. to c 40% sand, fine to med, brown 10 YR 5/3, moist to dry, mstrong reaction to HCl		7		
	34						
	36				8		
	38						
9:26	40					0.5 min/ft	
9:29					9		
	42						
	44						
	46				10		
	48						
9:34	50						
9:38					11	0.5 min/ft	
	52						
	54		- Sand is coarsening				
	56				12		
	58						
9:44	60		- 10% silt				
9:48					13	0.6 min/ft	
	62						
	64						
	66		- no more silt		14		
	68						
9:54	70					0.6 min/ft	

PROJECT: TEAD Ph... II RFI SWM058 | HOLE NO: C-45

PROJECT: TEAD Phase II RFI @ SWMU 58 | HOLE NO.: C-45 | SIGNATURE OF INSPECTOR: [signature] | DATE: 7/20/05 | PAGE: 3 of 7

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
9:58			Well graded Gravel with Sand 50-70% cobble to gravel 50-30% sand, med to coarse trace silt, brown 10YR5/3 moist, strong HCL reaction	X	15		
	72						
	74						
				X	16		
	76						
	78						
10:03						0.5 MIN/ft	crew hooks up auxillary compressor
10:10	80			X	17		
	82		Lean Clay with fine gravel (CL) high plasticity reddish brown 5YR 4/4 moist, weak HCL reaction				
	84			X	18		
	86		as above gravel with ~10% silt, very moist pinkish grey 5YR 6/2				
	88						
10:15	90			X	19	0.5 MIN/ft	
	92		Clayey fine Sand (SC) low plasticity, reddish brown 5YR 4/4, moist weak hcl reaction				
	94			X	20		
	96						
	98						
10:21	100			X	21	0.6 MIN/ft	
10:25	102		Silty Gravel ((GM) w/sand 60% gravel, 20% sand 20% silt, grey, dry, strong HCL				
	104						
	106			X	22		
	108		Lean Clay (CL) high plasticity reddish brown 5YR 4/4 Moist to almost wet, weak Reaction to HCL				
10:33	110					0.4 MIN/ft	

PROJECT: TEAD PHASE II RFI @ SWMU 58 | HOLE NO: C-45

PROJECT: TEAD Phase II RFI/SWMU 58 | HOLE NO. C-45 | SIGNATURE OF INSPECTOR: [signature] | DATE 7/29/05 | PAGE 4 of 7

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
10:35			Lean Clay as above (CL)	X	23		
	112		- Silty Gravel w/sand (GM) 70% gravel, SR to A f to c, 15% sand f to m, 15% silt, gray 5YR5/1, dry strong HCL reaction				
	114						
				X	24		
	116						
			- clayey sand w/gravel (SC) moderate plasticity, 30% gravel, coarse, subround reddish brown 5YR 4/4 moist, weak HCL reaction				
	118						
10:41							
10:50	120			X	25	0.6 min/ft	
	122		- Silty Gravel w/sand (GM) as above at 112'				
	124						
				X	26		
	126						
	128						
10:58							
11:01	130		- clayey sand (SC) with trace cobble (v4")	X	27	0.8 min/ft	
	132		- Silty Gravel (GM) as above				
	134						
				X	28		
	136						
	138						
11:10							
11:20	140			X	29	0.9 min/ft	
	142		- Well Graded Sand w/gravel (SW) 50-70% sand, fine to med 50-30% cobble+gravel trace silt, brown 7.5YR5/2 moist to dry, strong reaction to HCL				
	144						
				X	30		
	146						
	148						Shut Down to let head frig cooloff
11:33	150					1.3 min/ft	

PROJECT: TEAD Phase II RFI/SWMU 58 | HOLE NO.: C-45 | SIGNATURE OF INSPECTOR: [signature] | DATE: 7/28/08 | PAGE: 5 of 7

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
12:03			(SW) as above		32		
	152						
	154						
					32A		
	156						
			- strongly cemented gravels		32B		
	158						
			- Lean Clay (CL) high plasticity, reddish brown moist, weak HCL reaction				
12:14							
12:18	160					1.1 min/ft	
			- lithified nodules		33A		
	162		- cement - no gravel (lithified clay?) - weak HCL		33B		
			- Silty Gravel w/sand (GM) 70% gravel fine to coarse, Angular to subround, 20% silt 10% fine sand, gray, 7.5YR 6/1, Dry, strong hcl reaction				
	164						
					34		
	166						
	168						
12:27	170						
12:30					35	0.9 min/ft	
	172		- Well graded gravel w/sand (GW) 50-80% cobble + gravel, a to SR f to c 50-20% sand fine to medium, trace silt brown 10YR 5/3, Dry to moist strong reaction to HCl				
	174						
					36		
	176						
	178					1.8 min/ft	
12:48	180						
					37		
	182						
	184						
					38		
	186						
	188						
12:58	190					1.0 min/ft	

TEAD Phase II RFI @ SWMU 58 | HOLE NO. C-45 | SIGNATURE OF INSPECTOR [signature] | DATE 7/20/05 | PAGE 6 of 7

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
13:03			(GW) as above		39		
	192		- Strongly cemented gravel and cobble				
	194		- (GW) as above				
	196				40		
	198						
13:23	200					2.0 min/ft	
13:28					41A		
	202		- Fat Clay (CH) with gravel red 2.5YR 4/6, High plasticity		41B		
	204		10-20% fine gravel -cemented at the base Clay is non reactive to HCL - cement reacts strongly				
	206				42		
	208		- Sand is ~40% and very fine grain				
13:43	210					1.5 min/ft	
13:46					43		
	212						
	214						
	216		- Sand Decreases to 10-20%		44		
	218						
13:56	220					1.0 min/ft	Shut down head overheating
14:13					45		
	222						
	224						STATIC WATER 226.1' bgs
	226				46		
	228						
14:24	230					1.1 min/ft	

PROJECT TEAD Phase II RFI @ SWMU 58 | HOLE NO C-45

TEAD Phase II RFI SWMU 58 | HOLE NO. C-45 | SIGNATURE OF INSPECTOR | DATE 7/20/05 | PAGE 7 of 7

TIME	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	SAMPLE LOCATION	SAMPLE NO.	PENETRATION RATE	COMMENTS
14:27			(GW) as above		47		
	232						INITIAL WET CUTTINGS ▽
	234		- Clayey gravel (GC) with sand, moderate plasticity, ~30% cobble + gravel, light grey 10YR7/2 moist to wet, weak HCl				
	236		moderately cemented		48		
				PID 0.5			
	238		- Dry (GW) as above				
14:40							
7/21/05	240		- INNERBEDDED cemented gravels and silty gravels with sand (GM)			1.3 ft/min	
12:09					49		
	242			1.2			
	244						
					50		
	246			1.5			
	248						
12:24	250					1.5 ft/MN	1st Drum Full PARSNE0520201
12:37			- Silty Gravel (GM)		51		
	252			2.2			
12:45	254		- Well Graded Gravel w/sand (GW) 80% cobble + gravel, A to SR, f to C multicolor, wet, various reaction to HCl as per rock type				- Head is out of fuel
13:04					52		
	256			0.3			
			- Thin Lean clay seam				
	258						
13:10							
13:16	260		- as above (GW) but strongly cemented (calcic cement)			1.4 ft/min	
					53		
	262			0.9			
13:20							2ND Drum Full - PARSNE0520202
13:27	264						
				1.1			
	266				54		
					55		
	268			0.4			
13:38						1.3 ft/MIN	3RD Drum Full PARSNE0520203
	270						

PROJECT TEAD Phase II RFI @ SWMU 58 | HOLE NO C-45

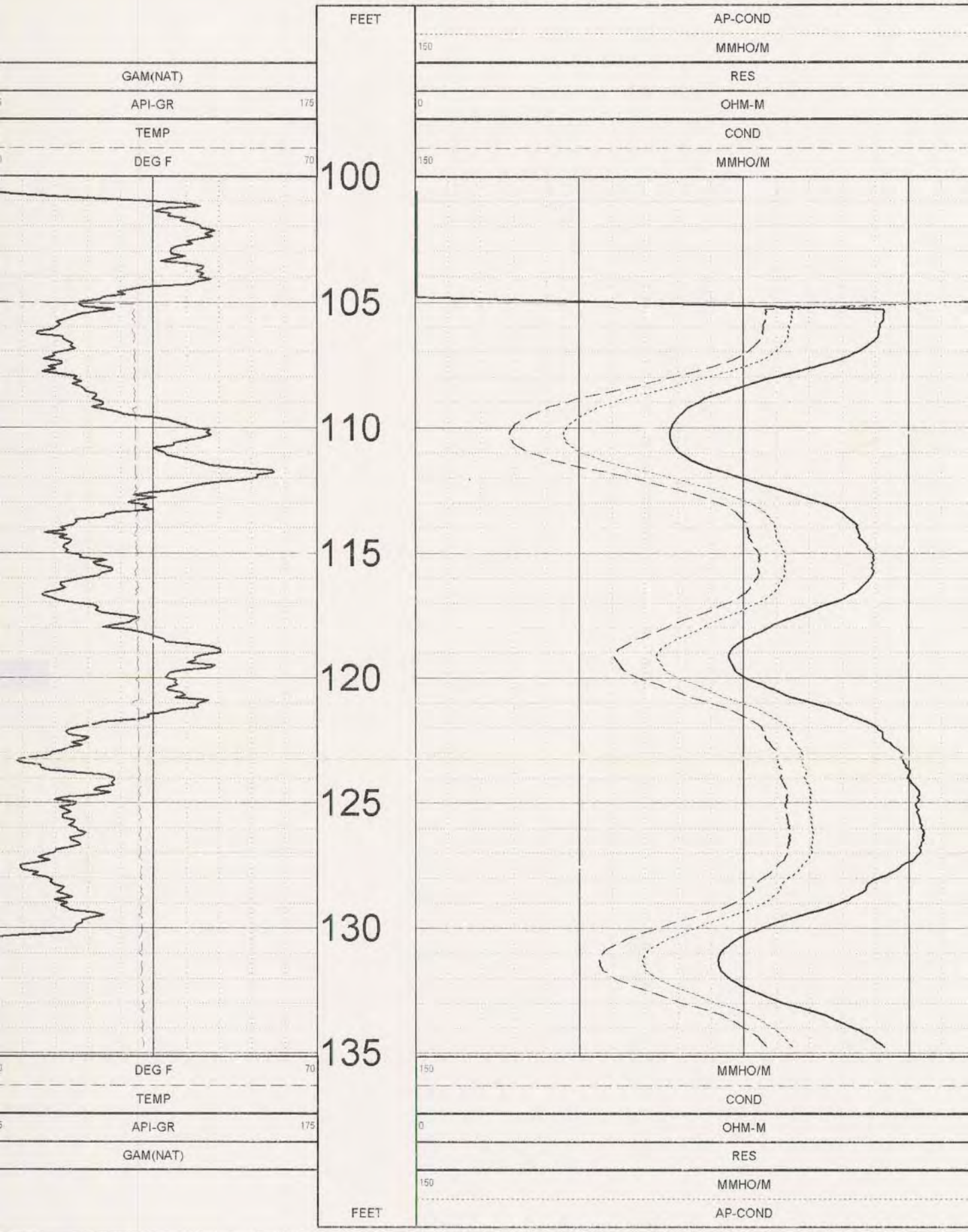
311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
email: PedlerRAS@aol.com • www.rasinc.org

Integrated Subsurface Evaluation

C-45-Rpt

COMPANY	: Parsons			OTHER SERVICES:	
WELL	: C-45-Rpt			None	
LOCATION/FIELD	: None			None	
COUNTY	: None			None	
STATE	: UT				
SECTION	: None	TOWNSHIP	: None	RANGE	: None
DATE	: 09/09/05	PERMANENT DATUM	: TOPVC		
DEPTH DRILLER	: 272.29			KB	: None
LOG BOTTOM	: 135.00	LOG MEASURED FROM:	None	DF	: None
LOG TOP	: 100.60	DRL MEASURED FROM:	None	GL	: 4687.20
CASING DIAMETER	:	LOGGING UNIT	: 202		
CASING TYPE	: PVC	FIELD OFFICE	:		
CASING THICKNESS:	0.2	RECORDED BY	: DM		
BIT SIZE	: 4.5	BOREHOLE FLUID	: 0	FILE	: ORIGINAL
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9512A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

7370229.15N
1405164.18E



TOOL CALIBRATION C-45-Rpt 09/09/05 12:16
TOOL 9512A
SERIAL NUMBER 1013

	DATE	TIME	SENSOR	STANDARD	RESP
1	Feb02,05	17:40:28	GAM(NAT)	21.311 [API-GR]	10.00 [CP
	Feb02,05	16:40:28	GAM(NAT)	187.500 [API-GR]	127.00 [CP
2	Aug16,05	20:30:22	AP-COND	0.000 [MMHO/M]	55467.00 [C
	Aug16,05	20:30:22	AP-COND	705.000 [MMHO/M]	110724.00 [C
3	Aug16,05	19:32:03	TEMP	33.500 [DEG F]	26878.00 [C
	Aug16,05	19:32:03	TEMP	134.400 [DEG F]	32180.00 [C
4	Dec21,99	17:30:50	A	0.414 [ ]	
5	Dec21,99	17:30:50	B	Default [ ]	

311 Rock Avenue • Golden, CO 80401
PH 303.526.4432 • FAX 303.526.4426
email: PedlerRAS@aol.com • www.rasinc.org

Integrated Subsurface Evaluation

C-45

COMPANY	: Parsons			OTHER SERVICES:	
WELL	: C-45			None	
LOCATION/FIELD	: None			None	
COUNTY	: None			None	
STATE	: UT				
SECTION	: None	TOWNSHIP	: None	RANGE	: None
DATE	: 09/09/05	PERMANENT DATUM	: TOPVC		
DEPTH DRILLER	: 272.29			KB	: None
LOG BOTTOM	: 268.10	LOG MEASURED FROM:	None	DF	: None
LOG TOP	: 0.70	DRL MEASURED FROM:	None	GL	: 4687.20
CASING DIAMETER	:	LOGGING UNIT	: 202		
CASING TYPE	: PVC	FIELD OFFICE	:		
CASING THICKNESS:	0.2	RECORDED BY	: DM		
BIT SIZE	: 4.5	BOREHOLE FLUID	: 0	FILE	: ORIGINAL
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9512A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

7370229.15N
1405164.18E

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

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KLEINFELDER
PARSONS
Date:09/23/2005
Project Number 48743.1B

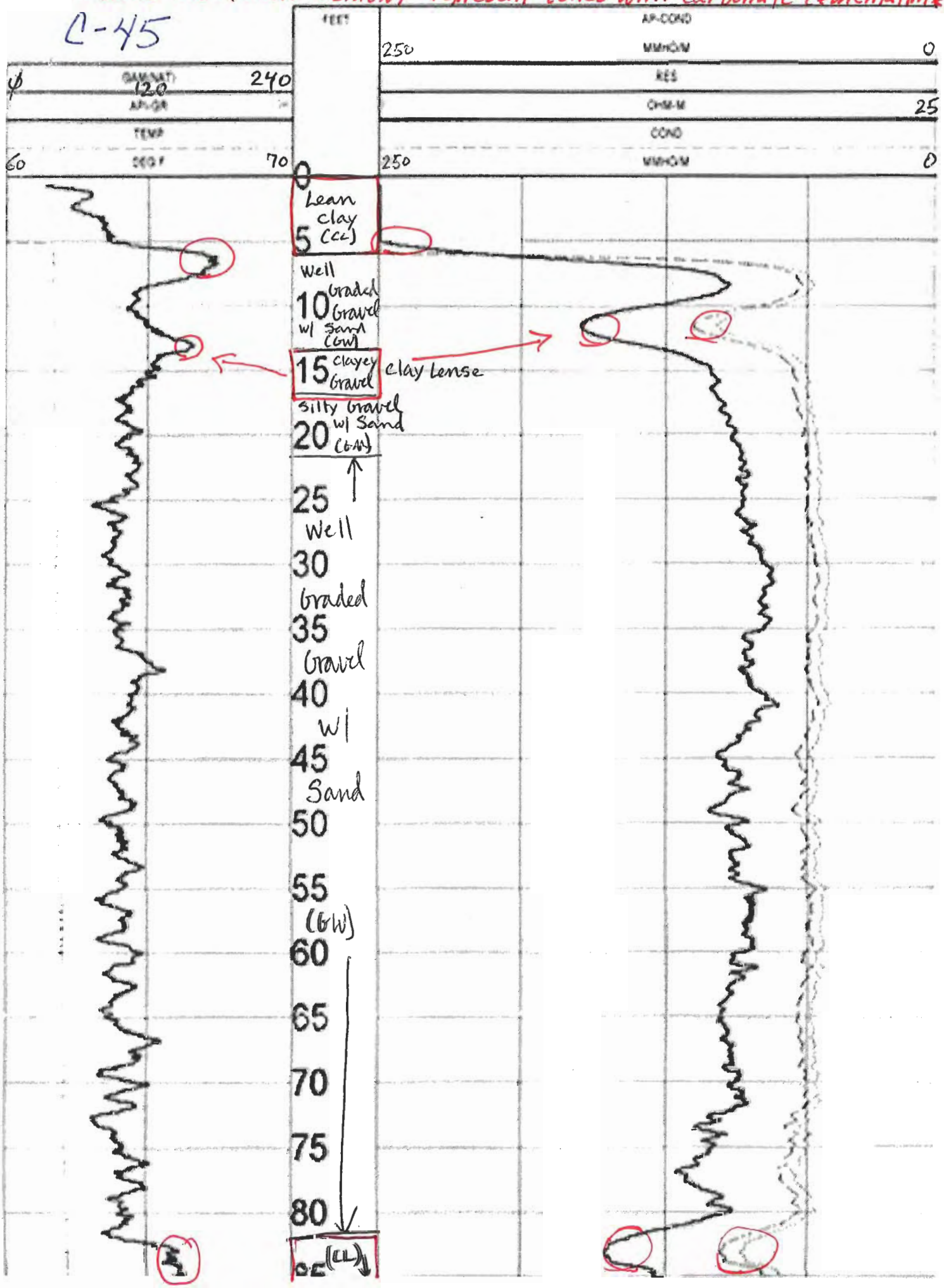
TEAD Phase II RFI

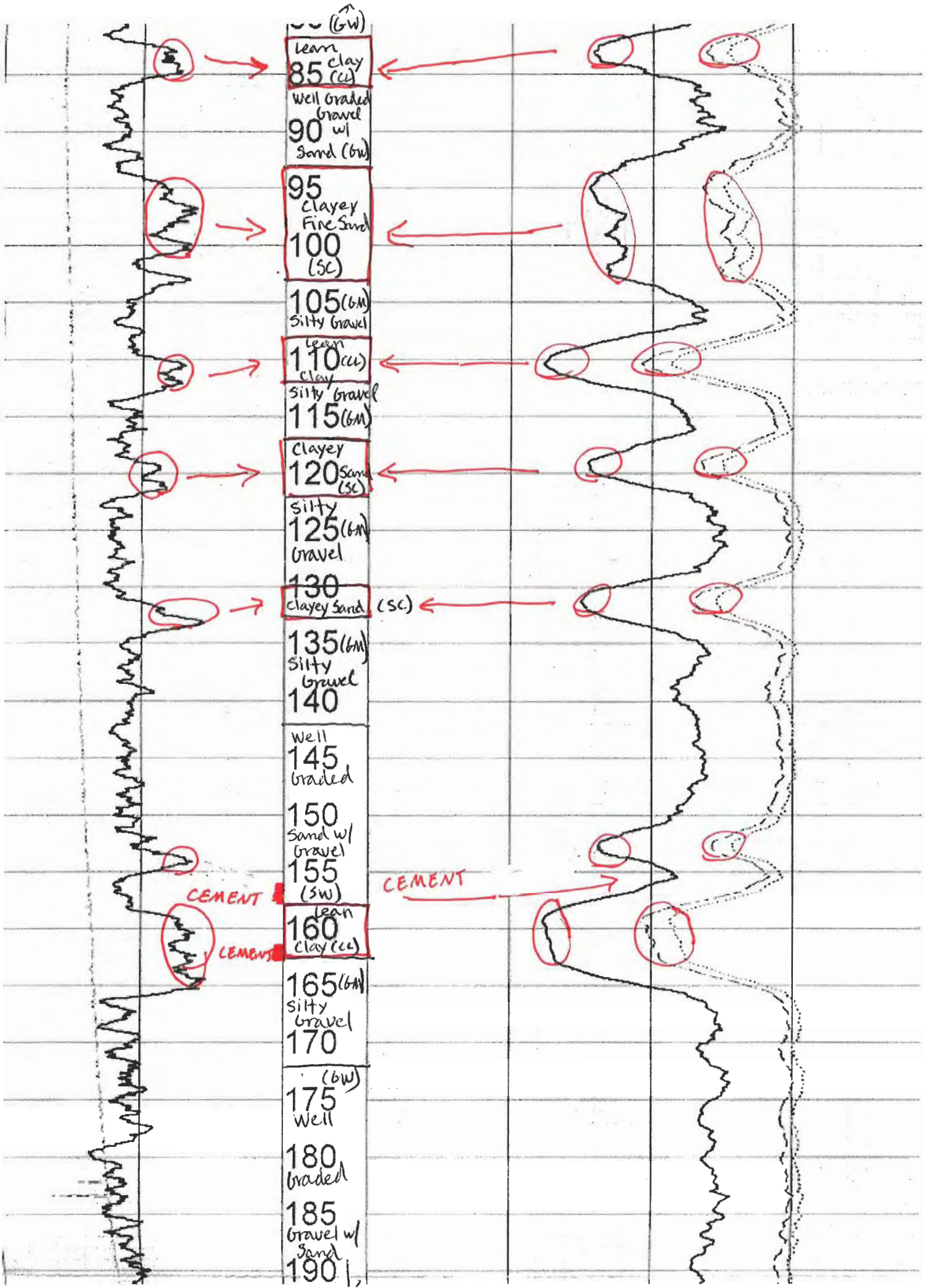
WELL C-45
NATURAL GAMMA AND
INDUCTION ELECTRICAL LOGS

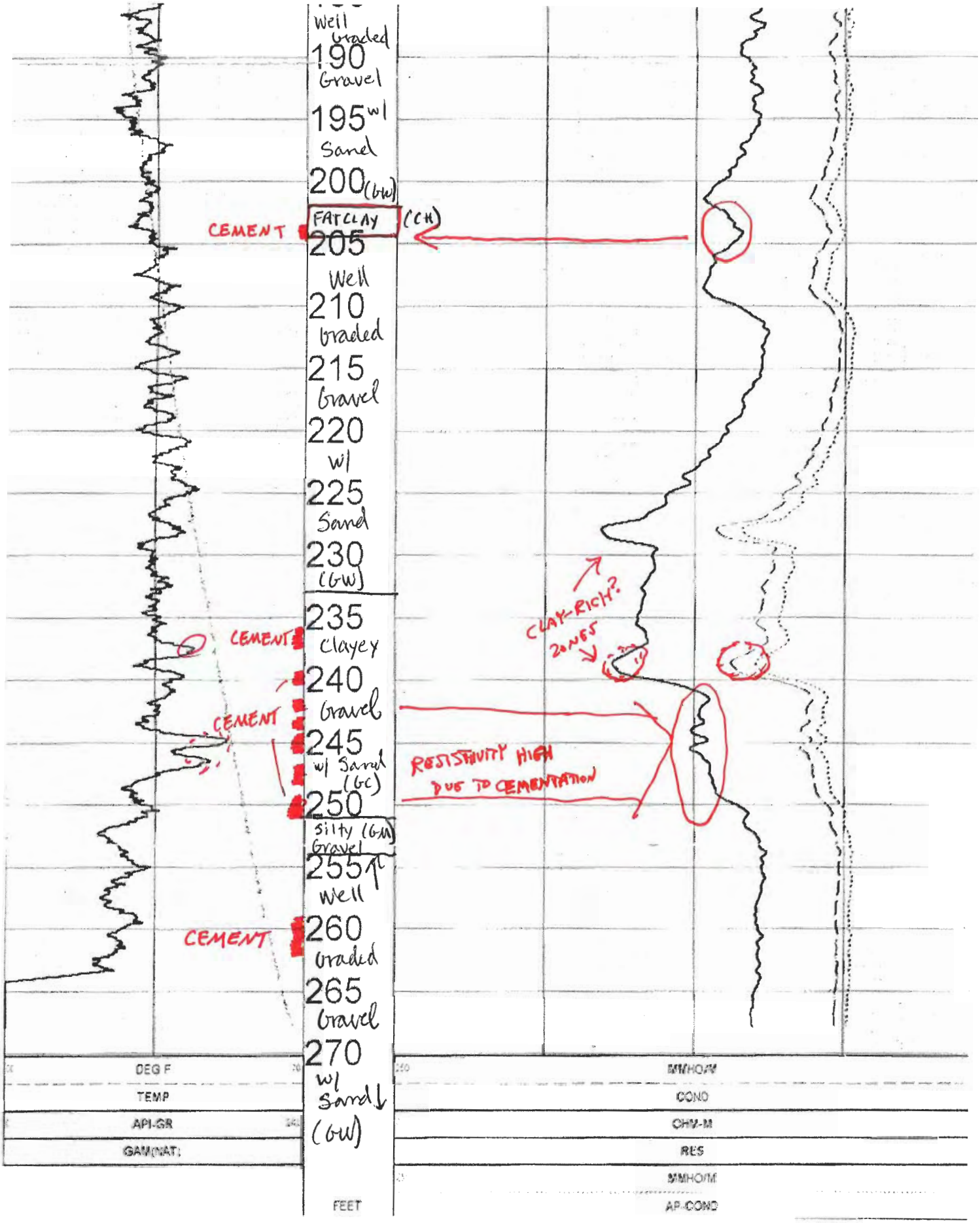
PLATE
C-2a

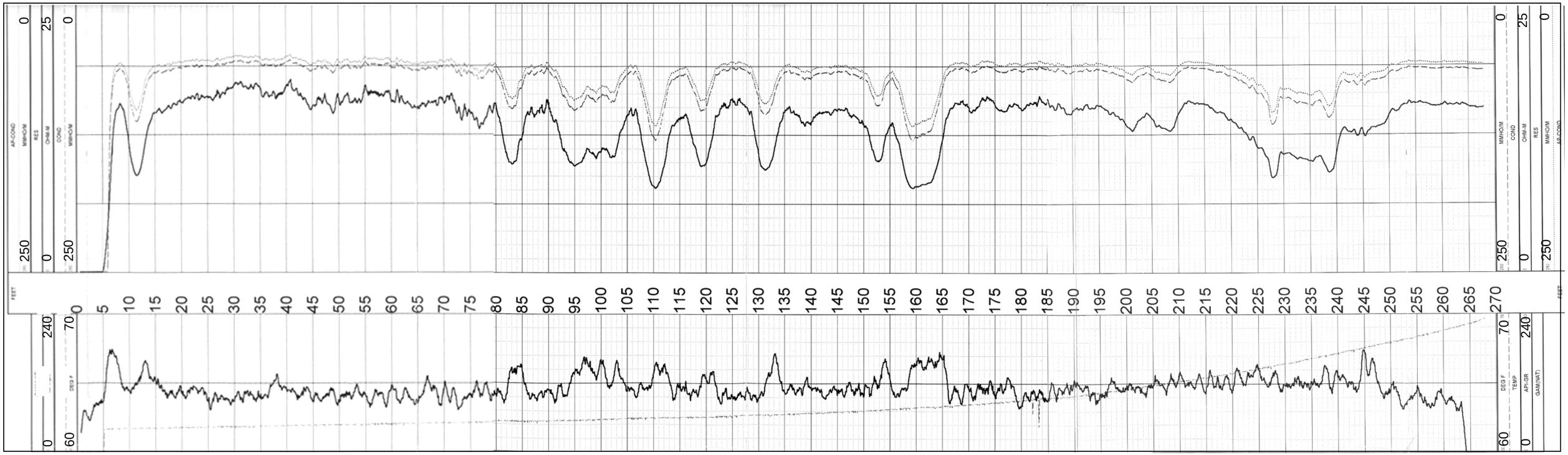
* zones labled with "CEMENT" represent zones with carbonate cementation *

C-45




(GW)
lean clay
85 (CL)
Well Graded Gravel w/ Sand (GW)
90
95
clayey Fine Sand
100 (SC)
105 (GM)
Silty Gravel
lean clay
110 (CL)
Silty Gravel
115 (GM)
clayey Sand
120 (SC)
Silty
125 (GM)
Gravel
130
clayey Sand (SC)
135 (GM)
Silty Gravel
140
Well
145
Graded
150
Sand w/ Gravel
155
(SW)
CEMENT
CEMENT
CEMENT
lean clay (CL)
160
165 (GM)
Silty Gravel
170
(GW)
175
Well
180
Graded
185
Gravel w/ Sand
190


Well graded
190
Gravel
195 w/
Sand
200 (GW)
FAT CLAY (CH)
CEMENT
205
Well
210
graded
215
Gravel
220
w/
225
Sand
230
(GW)
235
Clayey
240
Gravel
245
w/ Sand
(GC)
250
Silty (GM)
Gravel
255
Well
260
Graded
265
Gravel
270
w/
Sand
(GW)
CEMENT
CEMENT
CEMENT
CLAY-RICH? ZONES
RESISTIVITY HIGH DUE TO CEMENTATION
DEG F
TEMP
API-GR
GAM(NAT)
FEET
MMHO/M
COND
OHM-M
RES
MMHO/M
AP-COND



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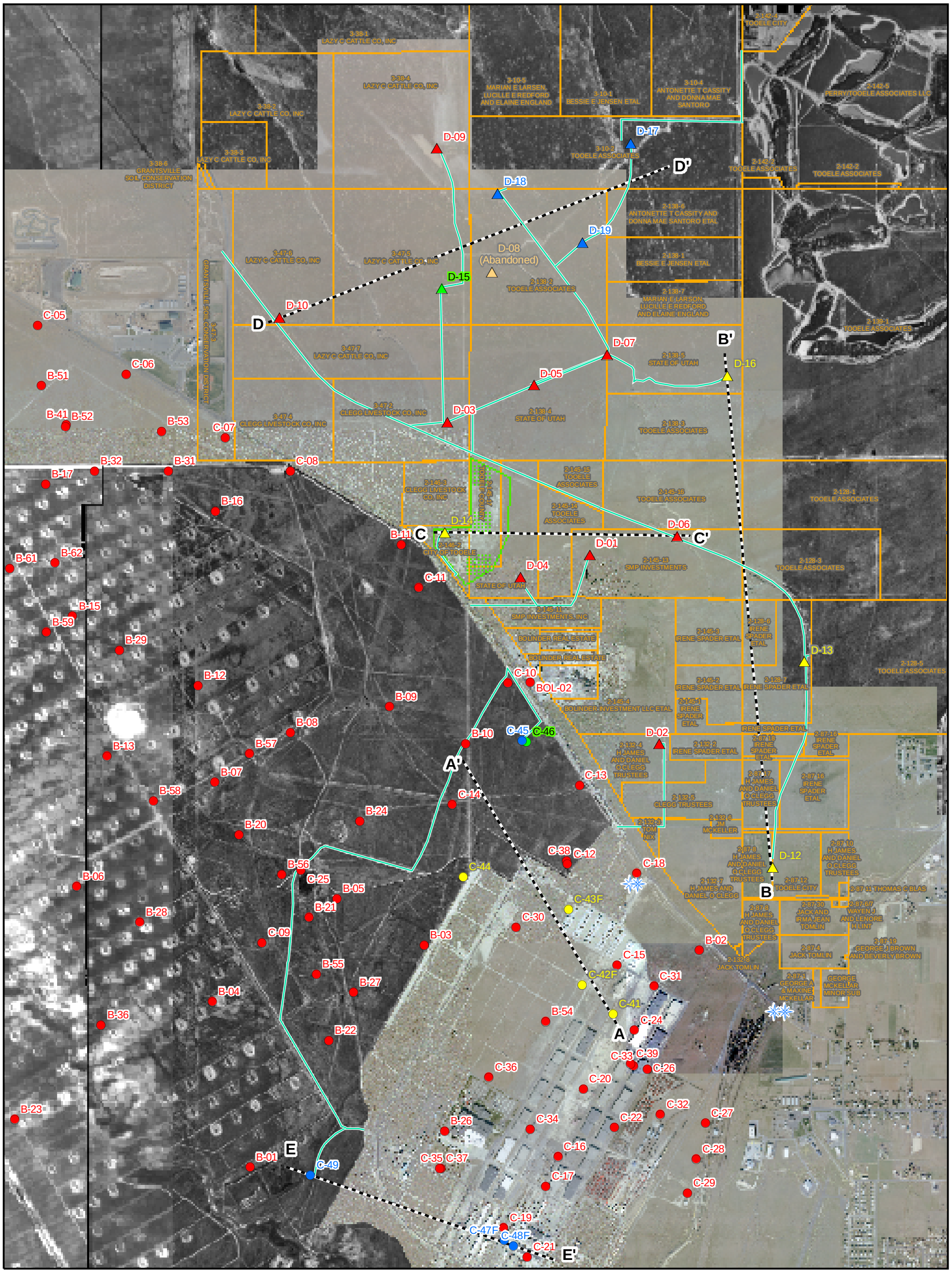
KLEINFELDER
PARSONS
Date: 03/24/2005
Project Number 48743.1B

TEAD Phase II RFI

WELL C-45
NATURAL GAMMA AND INDUCTION LOGS

PLATE
C-2b



LEGEND

Offsite Groundwater Monitoring Wells
- Phase I RFI Well
- Phase I RFI Well - Abandoned
- Phase II RFI - Installed Fall-Winter 2004
- Phase III RFI - Installed Summer 2005
- Proposed Phase II RFI Well

TEAD/UID Groundwater Monitoring Wells
- Existing Well
- Phase II RFI Well - Installed Fall-Winter 2004
- Phase II RFI Well - Installed Summer-Fall 2005
- Proposed Phase II RFI Well

- Survey Benchmark
- Approximate Phase II RFI Well Access Route
- Cross Section Line
- Former Landfill
- Parcel Boundaries / Owners

SWMU 58
PHASE II RFI
TOOELE ARMY DEPOT
TOOELE, UTAH

0 900 1,800
Feet

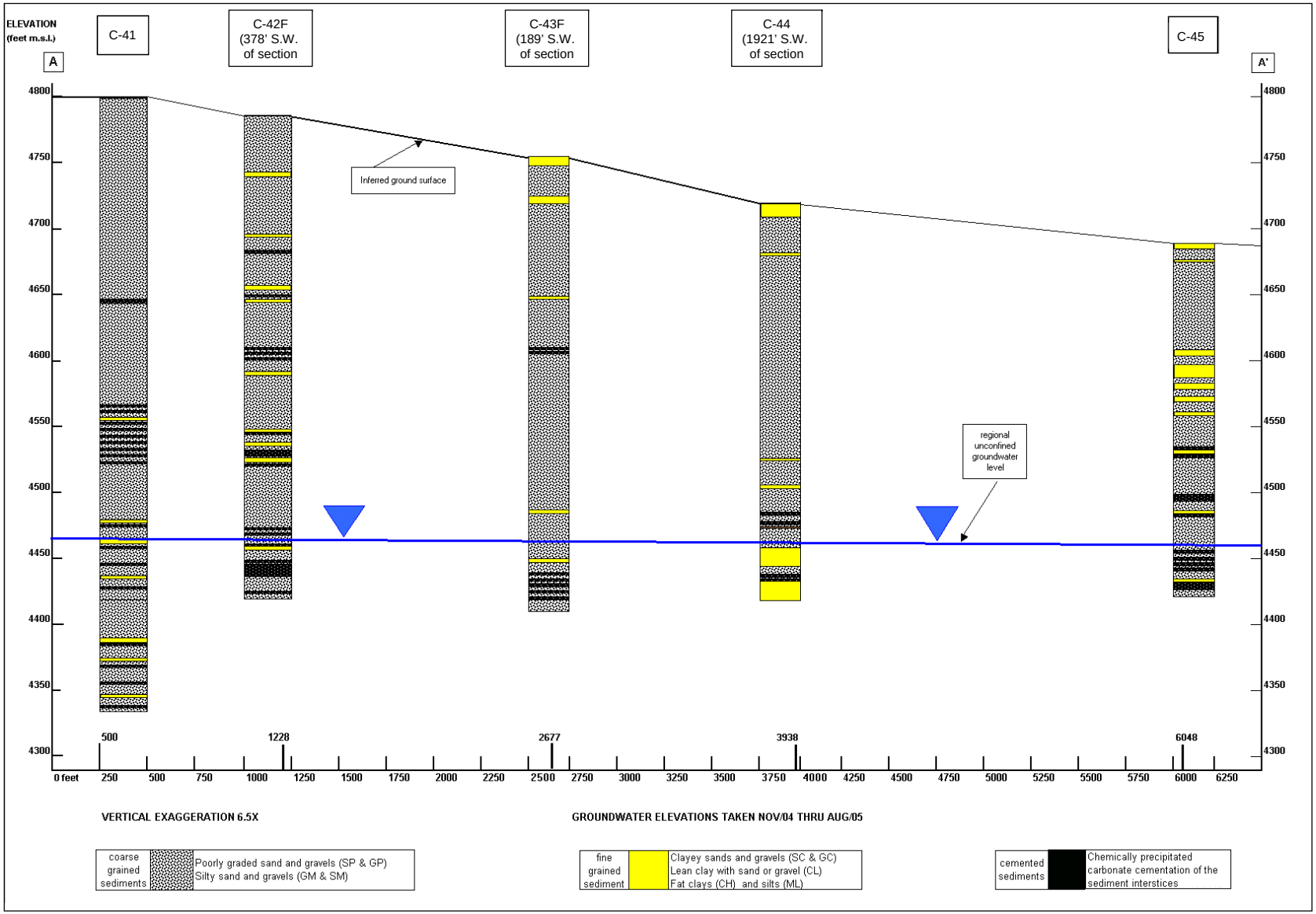
N

PLATE C-3

CROSS SECTION LOCATION DIAGRAM

w:\tooele\maps\well_comp_report_sept2005\cross_section_locations.mxd 01/09/06

PARSONS



KLEINFELDER
PARSONS
Date: 09/30/2005
Project Number 48743.1B

TEAD Phase II RFI @ SWMU 58

HYDROSTRATIGRAPHIC CROSS SECTION A - A'

SLC5Q044.ppt

PLATE

C-4

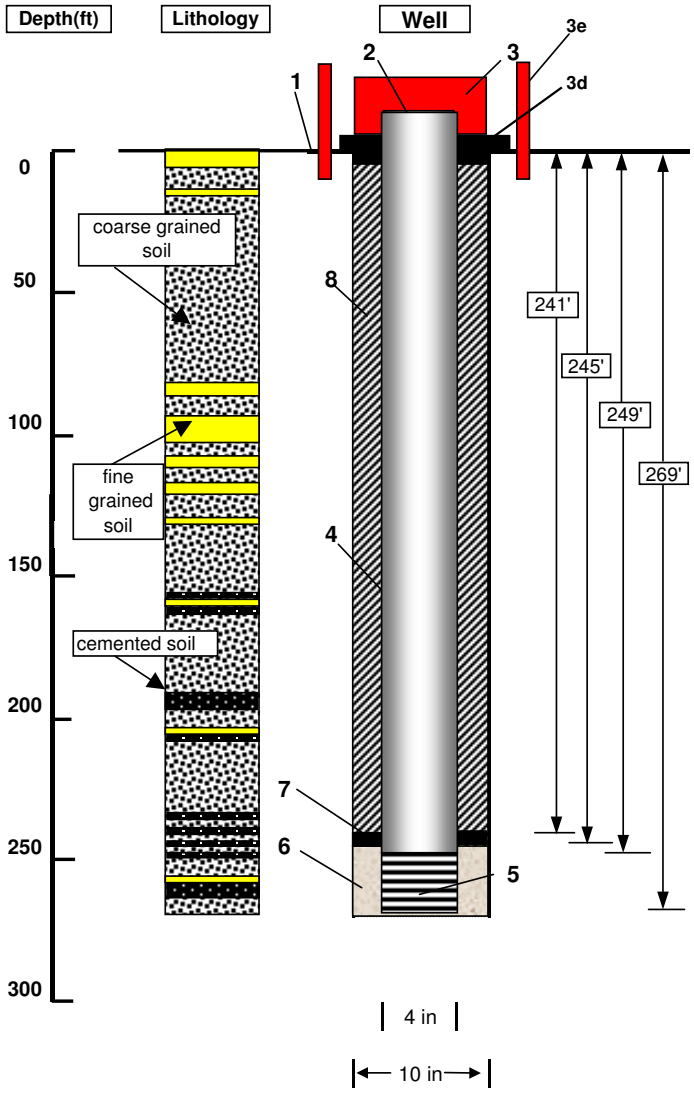
APPENDIX D

CONTRACTOR	WELL NUMBER	FIGURE
Kleinfelder/Parsons	C - 45	D-1

TEAD Phase II RFI - SWMU 58

MONITORING WELL INSTALLATION DATA RECORD

PROJECT :	**Phase II RFI - SWMU 58**	LOCATION :	**Tooele County, Utah**
DRILLING SUBCONTRACTOR :	**Layne Geoconstruction**	DRILLER:	**Tom Kearn**
DRILLING METHOD AND EQUIPMENT:	**Becker Hammer-Drill Systems AP1000**	HELPERS:	**Jake Smith**
WATER LEVEL : **229.62 ft (TOC) on 8/1/05**	START: **7/20/05** END: **7/25/05**	GEOLOGIST:	**Matt Ivers**



DRAWING NOT TO SCALE

1- Ground elevation at well : 4687.20 feet

2- Measuring point elevation : 4689.99 feet (top of well casing)

3- Surface compleation casing :
- a) type / diameter (ID/ OD) : Steel -10 inch ID / 10 3/8 inch OD
- b) height above ground : 3 feet
- c) length below ground : 3 feet
- d) type / quantity of sealant : Portland cement / 30 - 92.6 lb bags
- e) protective bollards : 4 - 4 inch steel concrete filled (4' ags - 2' bgs)

4- Well casing :
- a) type / diameter (ID/ OD) : Schedule 40 PVC / 4 inch
- b) height above ground : 2.79 feet
- c) length below ground : 269.69 feet
- d) type / quantity of sealant : see # 8
- e) well centralizers : none

5- Well screen :
- a) type / diameter (ID/ OD) : Schedule 40 PVC / 4 inch
- b) slot size : .010 inch
- c) lengths : 2 - 10 foot sections (249 to 269 feet bgs)

6- Well screen filter pack :
- a) type : #16 / 40 Colorado Silica Sand
- b) quantity used : 18 - 50 lb. bags
- c) method of placement : poured from surface
- d) length : 245.4 to 270 feet bgs

7- Bentonite seal :
- a) type/quantity : Cetco coated pellets / 2-5 gallon buckets
- b) length : 240.5 to 245.4 feet bgs

8- Grout :
- a) grout mix used per batch : 28 gal water to 2-50 lb bags bentonite grout
- b) method of placement : pumped from surface
- c) qty of well casing grout : 48 bags (approx 672 gallons)

Well development :
- a) method : bail and swab / pump and backflush
- b) time : 2 hour 53 minutes / 3 hours 56 minutes
- c) gallons : 120 / 1344

Pumping tests :
- a) drawdown / time : 0.18 feet / 37 minutes
- b) pumping rate : 7.01 to 8.28 gpm

Parsons Monitor Well Survey
Project # 744139
July 29, 2005

Well Id.	Northing	Easting	Elevation
D-17 HUB	7381797.23	1407266.17	4473.24
D-17 BRASS CAP	7381796.08	1407265.98	4473.81
D-17 PVC PIPE	7381795.49	1407265.97	4476.25
D-18 HUB	7380825.84	1404691.03	4473.20
D-18 BRASS CAP	7380824.69	140469.98	4473.89
D-18 PVC PIPE	7380823.93	1404691.14	4476.07
D-19 HUB	7379878.25	1406331.29	4494.99
D-19 BRASS CAP	7379877.08	1406330.96	4495.75
D-19 PVC PIPE	7379876.47	1406330.96	4497.75
C-45 HUB	7370231.04	1405164.10	4687.20
C-45 BRASS CAP	7370229.90	1405164.16	4687.78
C-45 PVC PIPE	7370229.15	1405164.18	4689.99

All coordinates are US State Plane 1983 (NAD 1983)
All elevations are NGVD 29 using NGS monument H-173.
All coordinates and elevations are expressed in feet.

Note that the "HUB" represents the ground surface.

Summary of Well Survey Data
TEAD Phase II RFI Groundwater Monitoring Wells

Well No.	Elevations (ft above MSL) Measuring Point	Brass Cap	Ground Surface	Top of Well Screen	Bottom of Well Screen	Coordinates for Measuring Point (ft) Northing	Easting	Section	Range	Township	PVC Riser Stickup (ft)
C-41	**4804.70**	**4802.32**	**4801.67**	**4445.68**	**4425.68**	**7364933.324**	**1406930.413**	**30**	**R 4 W**	**T 3 S**	**3.03**
C-42F	**4785.09**	**4785.52**	**4785.27**	**4445.27**	**4425.27**	**7365504.752**	**1406335.618**	**19**	**R 4 W**	**T 3 S**	**-0.18**
C-43F	**4754.87**	**4755.23**	**4755.21**	**4436.21**	**4416.21**	**7366968.52**	**1406061.58**	**19**	**R 4 W**	**T 3 S**	**-0.34**
C-44	**4722.81**	**4720.44**	**4719.82**	**4439.82**	**4419.82**	**7367591.88**	**1404021.61**	**24**	**R 5 W**	**T 3 S**	**2.99**
C-45	**4689.99**	**4687.78**	**4687.20**	**4438.20**	**4418.20**	**7370229.15**	**1405164.18**	**19**	**R 4 W**	**T 3 S**	**2.79**
C-47F	**4824.53**	**4825.08**	**4825.03**	**4476.08**	**4446.08**	**7360556.94**	**1404815.63**	**30**	**R 4 W**	**T 3 S**	**-0.50**
C-48F	**4823.67**	**4824.08**	**4824.03**	**4475.08**	**4445.08**	**7360431.77**	**1404989.18**	**30**	**R 4 W**	**T 3 S**	**-0.36**
C-49	**4710.02**	**4707.49**	**4706.90**	**4447.49**	**4427.49**	**7361802.01**	**1401065.35**	**25**	**R 5 W**	**T 3 S**	**3.12**
D-12	**4803.05**	**4800.56**	**4800.25**	**4455.25**	**4435.25**	**7367777.995**	**1410018.176**	**20**	**R 4 W**	**T 3 S**	**2.80**
D-13	**4720.05**	**4717.40**	**4717.32**	**4355.32**	**4335.32**	**7371760.079**	**1410629.706**	**17**	**R 4 W**	**T 3 S**	**2.73**
D-14	**4592.80**	**4590.93**	**4590.39**	**4335.39**	**4315.39**	**7374264.49**	**1403669.88**	**13**	**R 5 W**	**T 3 S**	**2.41**
D-16	**4580.11**	**4577.75**	**4577.20**	**4346.20**	**4326.20**	**7377300.289**	**1409139.940**	**7**	**R 4 W**	**T 3 S**	**2.91**
D-17	**4476.25**	**4473.81**	**4473.24**	**4343.24**	**4323.24**	**7381795.49**	**1407265.97**	**6**	**R 4 W**	**T 3 S**	**3.01**
D-18	**4476.07**	**4473.89**	**4473.20**	**4318.20** **4293.20**	**4298.20** **4268.20**	**7380823.93**	**1404691.14**	**7**	**R 4 W**	**T 3 S**	**2.87**
D-19	**4497.75**	**4495.75**	**4494.99**	**4346.99**	**4326.99**	**7379876.47**	**1406330.96**	**7**	**R 4 W**	**T 3 S**	**2.76**

MSL: mean sea level
F for selected well identifiers designates flush-mount surface completion.
Coordinates for measuring point are US State plane 1983, Utah Central 4302, NAD 1983 (CONUS), GEO1D96 (continental US)
All survey data generated by Ward Engineering of Salt Lake City, Utah

Note that well D-18 has two screened intervals.

APPENDIX E

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-45	Initial Depth to Water: 229.62'
Sample ID:	Total Depth of Well: 272.48'
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume:
Date: 8/1/05	(b) 1 Filter Pack Water Volume:
Sampled By: JRL	(a)+(b)x 3= Minimum Volume to Purge:
Method of ~~Sampling~~: Development 4" SS Bailer	Method of ~~Purging~~: Development 4" SS Bailer

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0919	1st	Bailer	3	64.1°	7.64	862	>1000					Cloudy fine
0946	10th	Bailer	30	63.6	8.07	899	>1000					Cloudy fine
1012	20th	Bailer	60	64.6	8.26	922	>1000					Tan Some
1015	Surging		well	w/	surge	Block						
1105	30th	Bailer	90	66.6	9.01	1044	>1000					Tan none
1109	Surging		well	w/	Surge	Block						
1202	40th	Bailer	120	66.7	8.88	1024	>1000					Tan None

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	990	Standard	5.39
Instrument reading		7.0 0854	10.0 0858	Instrument reading	991 0900	Instrument reading	5.39 0901

Notes:

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-45	Initial Depth to Water: 229.62'
Sample ID:	Total Depth of Well: 272.48
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 28 gal
Date: 8/1/05	(b) 1 Filter Pack Water Volume:
Sampled By: JCA	(a) + (b) x 3 = Minimum Volume to Purge: 84 gal
Method of ~~Sampling~~: Development 4" Submersible	Method of ~~Purging~~: Development 4" Submersible

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1339	272	7.01	0									
1351	272	7.14	84	67.5	8.32	1094	437					cloudy none
1403	272	7.14	168	66.3	8.03	1069	217					cloudy none
1415	272	7.01	252	65.7	7.94	1043	158					cloudy none
1416	Pump	off for	Recovery	Portion	of	Pump Test,	Also	Backf	lusing	well	5+	
1438	Parame	ters after	Backflush	67.3	8.02	1082	476					cloudy none
1450	272	7.01	336	66.9	7.95	1062	175					cloudy none
1502	272	7.14	420	67.3	7.97	1060	72.1					cloudy none
1514	272	7.01	504	66.3	7.85	1054	58.7					cloudy none
1526	272	7.01	588	67.8	7.86	1056	54.0					cloudy none
1527	Pump	off.	Backflushed		well	5x						
1534	Parameters	after	Backflush	65.7	8.00	1036	176					cloudy none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution		Standard	
Instrument reading				Instrument reading		Instrument reading	

Notes: 84 12

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-45	Initial Depth to Water:
Sample ID:	Total Depth of Well:
Duplicate ID:	Well Diameter:
Sample Depth:	(a) 1 Casing Volume:
Date: 8/1/05	(b) 1 Filter Pack Water Volume:
Sampled By: JDT	(a)+(b)x 3= Minimum Volume to Purge:
Method of Sampling:	Method of Purging:

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
1546	272	7.01	672	67.1	7.95	1047	77.1					cloudy none
1558	272	7.14	756	67.5	7.87	1063	46.5					cloudy none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution		Standard	
Instrument reading				Instrument reading		Instrument reading	

Notes:

VEOLIA Water

TOOELE ARMY DEPOT
MONITORING WELL SAMPLING DATA

Well ID: C-45	Initial Depth to Water: 229.62
Sample ID:	Total Depth of Well: 272.48
Duplicate ID:	Well Diameter: 4"
Sample Depth:	(a) 1 Casing Volume: 28 gal
Date: 8/2/05	(b) 1 Filter Pack Water Volume:
Sampled By: JAK	(a) + (b) x 3 = Minimum Volume to Purge: 84 gal
Method of ~~Sampling~~: Development 4" Submersible	Method of ~~Purging~~: Development 4" Submersible

Time	Intake depth	Rate (gpm)	Cum. vol. (gal)	Temp (°F)	pH (units)	Conductivity (µS/cm)	Turbidity (NTUs)	TDS (g/L)	DO (mg/L)	ORP (mv)	Salinity (ppt)	Color & Sediment
0852	272	7.01	756									
0904	272	7.01	840	66.2	7.84	942	25.5					clear none
0916	272	7.14	924	65.8	7.76	929	14.1					clear none
0928	272	7.01	1,008	66.5	7.70	942	6.46					clear none
0929	Pump	off	Backflushed		5x							
0941	Parameters after	Backflush		65.4	7.70	938	14.2					clear none
0953	272	7.01	1,092	66.7	7.67	946	5.47					clear none
1005	272	7.14	1,176	66.0	7.65	941	2.30					clear none
1017	272	7.01	1,260	66.9	7.67	956	2.01					clear none
1029	272	7.14	1,344	66.7	7.60	970	1.48					clear none

pH Calibration (select two)				Conductivity Meter Calibration		Turbidimeter Calibration	
Buffer solution	pH 4.0	pH 7.0	pH 10.0	Solution	990	Standard	5.39
Instrument reading		7.0 0835	10.0 0839	Instrument reading	990 0841	Instrument reading	5.39 0845

Notes: 84 L

Monday August 1, 2005
Weather: cloudy, Rain ~80°
Wind: None

0833	Arrive at C-45 and start Setup SWL 229.62 TD 272.48'
0849	Calibrated Equipment
0919	1st Bailer Removed, Parameters Taken
0946	10th Bailer Removed, Parameters Taken
1015	Surging well w/ Surge Block
~~1109~~	~~Surging well~~ JH
1105	30 Bailer removed, Parameters Taken
1109	Surging well w/ surge Block
LE 1012	20th Bailer removed, Parameters Taken
1202	40th Baile removed, Parameters Taken
1233	Lowering pump and piping
1338	Pump on, establishing flow. Drawdown portion of pump Test Started
1339	Flow established at 7 gpm. Intake 272
1416	Pump off to complete Recovery Portion of pump test and well Backflushing
1438	Pump on, Parameters Taken after Backflush
1527	Pump off, Backflushing well 5+
1534	Pump on, Parameters after Backflush
1559	Pump off for Today, will continue pumping tomorrow
	Cleaning and Securing well-site
1614	Leaving C-45 → 90 day yard
1637	Arrive at 90 day yard, off loading ~876 gal of Development water
1705	Leaving 90 day yard → GWTP

Tuesday August 2, 2005
Weather: Sunny, Warm ~80°
Wind: Breeze from South

0822	Arrive at C-45 and start Setup
0833	Calibrated Equipment
0851	Pump on establishing Flow
0852	Flow established at 7 gpm, Intake 272'
0929	Pump off, BackFlushed well 5x
0941	Pump on, Parameters Taken after Backflush
1029	Pump off, Parameters stable for 3 consecutive volumes, Turbidity 1.48 NTU's
1047	Removing pump and piping
1152	Decon Equipment, Cleaned up wellsite
1249	Leaving C-45 → 90 day yard
1325	Arrive at 90 day yard and offloading ~600 gal of Development water
1401	Leaving 90 day yard → GWTP

Owner Tooele Army Depot Address _____ County Tooele State UT

Date 8/1/05 Company performing test Parsons/Veolia Water Measured by Jeff Hanmann

No. C-45 Distance from pumping well _____ Type of test Constant Pumping Rate Drawdown/Recovery Test No. _____

Measuring equipment Solinst water Level meter

Time Data
Pump on: Date 8/1/05 Time 1338 (t)
Pump off: Date 8/1/05 Time 1415 (t')
Duration of aquifer test:
Pumping 37 min Recovery 15 min

Water Level Data
Static water level 229.76 ft
Measuring point BTOC
Elevation of measuring point _____

Discharge Data
How Q measured Flowmeter
Depth of pump/air line 279 ft
Previous pumping? Yes ____ No x
Duration ____ End ____

Comments on factors affecting test data

Date	Clock time	Time since pump started t	Time since pump stopped t'	t/t'		Depth to water Water level measurement	Correction or Conversion	Water level	Water level change s or s'		Discharge measurement	(Gpm) Rate		
8/1/05	1338	0				229.76								Pumping started
	1339	1				229.94						8.28		
	1340	2				229.94						7.90		
	1341	3				229.94						7.14		
	1342	4				229.94						7.01		
	1345	7				229.94						7.14		
	1350	12				229.94						7.01		
	1355	17				229.94						7.14		
	1400	22				229.94						7.01		
	1405	27				229.94						7.01		
	1410	32				229.94						7.14		
	1415	37				229.94						7.01		Pump off
	1416	38	1			229.55								
	1417	39	2			229.60								
	1418	40	3			229.69								
	1419	41	4			229.69								
	1420	42	5			229.70								
	1425	47	10			229.70								
	1430	52	15			229.70								

APPENDIX F

September 15, 2005
Weather: Clear, Cool ~70°
Wind: Breeze from South

1012 Arrive at C-45 and start Setup
SWL 229.96 (BTOC)
1150 Installed 5 samplers. 3 at 249 ft bgs, Top of Sampler, 1 at 259 ft bgs (Top of Sampler) and 1 at 269 ft bgs bottom of Sampler
1205 Leaving C-45 → D-17
1337 Arrive at D-17 and start Setup
SWL 112.53 (BTOC)
1346 Installed 1 Sampler at 140 ft bgs, Top of Sampler
1354 Leaving D-17 → D-19
1357 Arrive at D-19 and start set up
SWL 133.00 (BTOC)
1419 Installed 5 Samplers. 3 at 148 ft bgs, Top of Sampler, 1 at 158 ft bgs, Top of Sampler and 1 at 168 ft bgs, bottom of sampler
1431 Leaving D-19 → D-18
Arrive at D-18 and start Setup
SWL 142.98 (BTOC)
1521 Installed 8 Samplers 3 at 155 Ft bgs, Top of Sampler, 1 at 165 ft bgs, Top of Sampler and 1 at 175 ft bgs, bottom of Sampler. 1 at 180 ft bgs Top of Sampler, 1 at 192 ft bgs, Top of Sampler, and 1 at 205 ft bgs, Bottom of Sampler
1542 Leaving D-18 → GWTP

Monday October 3, 2005
Weather: Cloudy, Cool ~60°
Wind: None

0758 Arrive at C-45 and preparing to Sample
0836 Removing Samplers
24 1 SM VOA's Taken, 40 mL w/HCL
0841 (3) C-45 GW001 (249')
0841 (3) C-45 ~~GW~~ MS001 (249')
0841 (3) C-45 SD001 (249')
(0850) (3) C-45 FD001 (249')
0841 (3) C-45 FR001 (249')
0903 (3) C-45 GW002 (259')
0908 (3) C-45 GW003 (269')
0932 Leaving C-45 → GWTP

ANALYTICAL QUALITY CONTROL SUMMARY

Samples were collected in accordance with the analytical and quality control specifications of the Final Phase II RCRA Facility Investigation SWMU-58 Work Plan (Parsons, 2003) and the Tooele Industrial Area Project CDQMP and QAPP. Passive diffusion bag samplers were deployed in well C-45 on September 15, 2005. Samples including field quality control samples were collected on October 3, 2005 and submitted to Severn Trent Laboratories, a Utah and USACE-certified analytical laboratory.

Results were received and submitted to third party data review by Synectics. Data review included checks of the following data quality elements: Holding times, continuing calibration verification, method blanks, field blanks, laboratory control sample recovery, matrix spike and matrix spike duplicate recovery and precision, surrogate recovery, and field duplicate precision. There were minor quality control issues found in the data package for C-45. The TCE results were J/UJ flagged for reanalysis holding times >14 days. 1,1-dichloroethene results were J/UJ flagged due to LCS % recovery issues. All data is suitable for use. Analytical and data validation reports are attached.

SEVERN TRENT STL®

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

October 30, 2005

STL SACRAMENTO PROJECT NUMBER: G5J070276
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on October 6, 2005. These samples are associated with your Tooele project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5J070276

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5J070276

General Comments

Samples were received at 2 degrees C.

WATER, 8260B, Volatile Organics

The samples were analysed for Volatile Organics by Method 8260B (GC-MS). Detection is achieved by purge and trap gas chromatography – Mass Spectrometry. All QC criteria were met except as noted below.

Samples 6, 8, 9, 10-14

Samples were all analyzed before the holding time expired. However, review of the data showed that 1 or more analytes were present in the sample at levels outside of the instrument calibration range. As a consequence, these samples were reanalyzed at dilutions, but the reanalysis was past the holding time date. Both sets of data will be reported.

Due to possible carry over contribution sample G5J070276-14 was reanalyzed two days beyond recommended hold time. Results for both analyses are reported.

There were no other anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5J070276

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HL9K7	1	D-19FD001	10/4/2005 08:05 AM	10/6/2005 09:10 AM
HL9LG	2	D-19GW001	10/4/2005 07:58 AM	10/6/2005 09:10 AM
HL9LR	3	D-19GW002	10/4/2005 08:07 AM	10/6/2005 09:10 AM
HL9LX	4	D-19GW003	10/4/2005 08:10 AM	10/6/2005 09:10 AM
HL9L4	5	D-17GW001	10/4/2005 08:36 AM	10/6/2005 09:10 AM
HL9L5	6	C-45FD001	10/3/2005 08:50 AM	10/6/2005 09:10 AM
HL9L8	7	C-45GW001	10/3/2005 08:41 AM	10/6/2005 09:10 AM
HL9MD	8	C-45GW002	10/3/2005 09:03 AM	10/6/2005 09:10 AM
HL9MH	9	C-45GW003	10/3/2005 09:08 AM	10/6/2005 09:10 AM
HL9MJ	10	C-48FGW001	10/4/2005 03:16 PM	10/6/2005 09:10 AM
HL9ML	11	C-48FGW002	10/4/2005 03:19 PM	10/6/2005 09:10 AM
HL9MQ	12	C-48FGW003	10/4/2005 03:22 PM	10/6/2005 09:10 AM
HL9MX	13	C-48FGW004	10/4/2005 03:26 PM	10/6/2005 09:10 AM
HL9M3	14	D-18GW007	10/4/2005	10/6/2005 09:10 AM
HL9NL	15	D-18GW008	10/4/2005	10/6/2005 09:10 AM
HL9NP	16	D-18GW009	10/4/2005	10/6/2005 09:10 AM
HL9NT	17	D-18GW010	10/4/2005	10/6/2005 09:10 AM
HL9NW	18	D-18GW011	10/4/2005	10/6/2005 09:10 AM
HL9N3	19	D-18GW012	10/4/2005	10/6/2005 09:10 AM
HL9N5	20	PARSTB12	10/3/2005 07:00 AM	10/6/2005 09:10 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 988

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

JS 10/6/05

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-45	C-45	C-45FD001	WG	DF	FD	1	10/3/05	0850	jnt	249'	-	3
Analysis		**Lab**	**Cooler**	**No. Conts**	**AB Lot**	**EB Lot**	**TB Lot**	**Remarks:**				
VOC		SVLS										

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-45	C-45	C-45GW001	WG	DF	N	1	10/3/05	0841	jnt	249'	-	3
Analysis		**Lab**	**Cooler**	**No. Conts**	**AB Lot**	**EB Lot**	**TB Lot**	**Remarks:**				
VOC		SVLS										

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-45	C-45	C-45MS001	WG	DF	MS	1	10/3/05	0841	jnt	249'	-	3
Analysis		**Lab**	**Cooler**	**No. Conts**	**AB Lot**	**EB Lot**	**TB Lot**	**Remarks:**				
VOC		SVLS										

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-45	C-45	C-45SD001	WG	DF	SD	1	10/3/05	0841	jnt	249'	-	3
Analysis		**Lab**	**Cooler**	**No. Conts**	**AB Lot**	**EB Lot**	**TB Lot**	**Remarks:**				
VOC		SVLS										

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 06 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Jeff Hammann	10/5/05 0800		10/05/05 0800
To: FedEx	10/5/05 1630		10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, September 15, 2005

STL Sacramento (916) 373 - 5600

8 of 1112

*Labeled C45SD001 JS 10/6/05

CHAIN OF CUSTODY

PARSONS

COC ID: 990

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-45	C-45	C-45GW002	WG	DF	N	1	10/3/05	0903	JAT	259'	—	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 06 2005
INI SS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature]	10/5/05 1000	[signature]	10/5/05 1000
[signature] To: FedEx	10/5/05 1630	[signature]	10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, September 15, 2005

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 991

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
C-45	C-45	C-45GW003	WG	DF	N	1	10/3/05	0908	gnt	269'	-	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 0 6 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature]	10/5/05 1000	[signature]	10/5/05 1000
[signature] TO. FED EX	10/5/05 1630	[signature]	10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, September 15, 2005

STL Sacramento (916) 373 - 5600

G5J070276

CHAIN OF CUSTODY

PARSONS

COC ID: 1018

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	FIELDQC	PARSTB12	WQ	NA	TB	1	10/3/05	0700	JGH	0	0	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS					

Remarks:

RECEIVED IN GOOD CONDITION
UNDER COC
OCT 0 6 2005
INI JS

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Hannan	10/5/05 0800		10/5/05 0800
To: FedEx	10/5/05 1630	Jy Sadler	10/6/05 1440

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Friday, September 16, 2005

STL Sacramento (916) 373 - 5600

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SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NV LOG # 34926

LOT# (QUANTIMS ID) G5J070276 QUOTE# 62837 LOCATION WB

	Initials	Date
DATE RECEIVED 10/6/05 TIME RECEIVED 0910	JS	10/6/05

DELIVERED BY
- [X] FEDEX
- [ ] CA OVERNIGHT
- [ ] CLIENT
- [ ] AIRBORNE
- [ ] GOLDENSTATE
- [ ] DHL
- [ ] UPS
- [ ] BAX GLOBAL
- [ ] GO-GETTERS
- [ ] STL COURIER
- [ ] COURIERS ON DEMAND
- [ ] OTHER

CUSTODY SEAL STATUS [X] INTACT [ ] BROKEN [ ] N/A

CUSTODY SEAL #(S) ~~396684~~ JS 396684, 438930

SHIPPPING CONTAINER(S) [ ] STL [X] CLIENT [ ] N/A

TEMPERTURE RECORD (IN °C) IR 1 [X] 3 [ ] [ ] OTHER _____

COC #(S) N/A

TEMPERATURE BLANK Observed: 2 Corrected: 2

SAMPLE TEMPERATURE

Observed: 2 2 3 Average: 2 Corrected Average: 2

COLLECTOR'S NAME: [ ] Verified from COC [X] Not on COC

pH MEASURED [ ] YES [ ] ANOMALY [X] N/A

LABELED BY..... CB 10/7/05

LABELS CHECKED BY.....

PEER REVIEW _____ [X] NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING

WETCHEM [X] N/A

VOA-ENCORES [X] N/A

[ ] METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL [X] N/A

[X] COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES [ ] N/A

[ ] Clouseau [ ] TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 [X] N/A

[ ] WET ICE [ ] BLUE ICE [ ] GEL PACK [ ] NO COOLING AGENTS USED [ ] PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

Groundwater Analytical Results

Parsons Corporation

Client Sample ID: C-45FD001

GC/MS Volatiles

Lot-Sample #...: G5J070276-006 **Work Order #...:** HL9L51AA **Matrix.....:** WG
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**3.4**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.32 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**190 AA,D**	**10**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	96	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

D Result was obtained from the analysis of a dilution.

AA = Analyzed at a 10X dilution on 10/20/05

Parsons Corporation

Client Sample ID: C-45GW001

GC/MS Volatiles

Lot-Sample #...: G5J070276-007 **Work Order #...:** HL9L81AA **Matrix.....:** WG
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 10 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND Q	10	ug/L	1.3
Carbon tetrachloride	**3.4 J**	**10**	**ug/L**	**1.5**
Chloroethane	ND	10	ug/L	3.4
Chloroform	ND	10	ug/L	1.2
1,1-Dichloroethane	ND	10	ug/L	1.0
1,2-Dichloroethane	ND	10	ug/L	2.2
cis-1,2-Dichloroethene	ND	10	ug/L	1.0
trans-1,2-Dichloroethene	ND	10	ug/L	1.1
1,1-Dichloroethene	ND	10	ug/L	3.6
1,2-Dichloropropane	ND	10	ug/L	1.5
Ethylbenzene	ND	10	ug/L	2.7
Methylene chloride	ND	20	ug/L	3.5
Naphthalene	ND	10	ug/L	1.5
Tetrachloroethene	ND	10	ug/L	3.8
Toluene	ND	10	ug/L	2.5
1,1,1-Trichloroethane	ND	10	ug/L	4.1
1,1,2-Trichloroethane	ND	10	ug/L	3.1
Trichloroethene	**280**	**10**	**ug/L**	**3.1**
Vinyl chloride	ND	10	ug/L	1.2
m-Xylene & p-Xylene	ND	10	ug/L	1.8
o-Xylene	ND	10	ug/L	1.0

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	101	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
Toluene-d8	106	(70 - 130)
Dibromofluoromethane	96	(70 - 130)

NOTE(S):

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

J Estimated result. Result is less than RL.

Parsons Corporation

Client Sample ID: C-45GW002

GC/MS Volatiles

Lot-Sample #...: G5J070276-008 **Work Order #...:** HL9MD1AA **Matrix.....:** WG
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**3.2**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.35 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**200 AA,D**	**10**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	103	(70 - 130)
1,2-Dichloroethane-d4	95	(70 - 130)
Toluene-d8	109	(70 - 130)
Dibromofluoromethane	101	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

D Result was obtained from the analysis of a dilution.

AA = Analyzed at a 10X dilution on 10/20/05

Parsons Corporation

Client Sample ID: C-45GW003

GC/MS Volatiles

Lot-Sample #...: G5J070276-009 **Work Order #...:** HL9MH1AA **Matrix.....:** WG
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	**3.0**	**1.0**	**ug/L**	**0.15**
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.29 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**180 AA,D**	**10**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	101	(70 - 130)
1,2-Dichloroethane-d4	94	(70 - 130)
Toluene-d8	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

D Result was obtained from the analysis of a dilution.

AA = Analyzed at a 10X dilution on 10/20/05

Parsons Corporation

Client Sample ID: PARSTB12

GC/MS Volatiles

Lot-Sample #...: G5J070276-020 **Work Order #...:** HL9N51AA **Matrix.....:** WQ
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	ND	1.0	ug/L	0.12
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	ND	1.0	ug/L	0.15
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	ND	1.0	ug/L	0.25
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	ND	1.0	ug/L	0.31
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
1,2-Dichloroethane-d4	93	(70 - 130)
Toluene-d8	107	(70 - 130)
Dibromofluoromethane	98	(70 - 130)

QC DATA ASSOCIATION SUMMARY

G5J070276

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WG	SW846 8260B		5292173	
002	WG	SW846 8260B		5292173	
003	WG	SW846 8260B		5292173	
004	WG	SW846 8260B		5292173	
005	WG	SW846 8260B		5292173	
006	WG	SW846 8260B		5291444	5291272
007	WG	SW846 8260B		5291444	5291272
008	WG	SW846 8260B		5291444	5291272
009	WG	SW846 8260B		5291444	5291272
010	WG	SW846 8260B		5292173	
011	WG	SW846 8260B		5292173	
012	WG	SW846 8260B		5292173	
013	WG	SW846 8260B		5292173	
014	WG	SW846 8260B		5292173	
015	WG	SW846 8260B		5292173	
016	WG	SW846 8260B		5292302	
017	WG	SW846 8260B		5292302	
018	WG	SW846 8260B		5292302	
019	WG	SW846 8260B		5292302	
020	WQ	SW846 8260B		5291444	5291272

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AA **Matrix.....:** WATER
MB Lot-Sample #: G5J180000-444

Prep Date.....: 10/17/05
Analysis Date..: 10/17/05 **Prep Batch #...:** 5291444
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	105	(70 - 130)
1,2-Dichloroethane-d4	89	(70 - 130)
Toluene-d8	102	(70 - 130)
Dibromofluoromethane	92	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM2P71AA **Matrix.....:** WATER
MB Lot-Sample #: G5J190000-173

Prep Date.....: 10/18/05
Analysis Date..: 10/18/05 **Prep Batch #...:** 5292173
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	102	(70 - 130)
1,2-Dichloroethane-d4	96	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	102	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AA **Matrix.....:** WATER
MB Lot-Sample #: G5J190000-302

Prep Date.....: 10/18/05
Analysis Date..: 10/18/05 **Prep Batch #...:** 5292302
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	114	(70 - 130)
1,2-Dichloroethane-d4	125	(70 - 130)
Toluene-d8	119	(70 - 130)
Dibromofluoromethane	122	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AC **Matrix.....:** WATER
LCS Lot-Sample#: G5J180000-444
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Benzene	**91**	**(80 - 120)**	**SW846 8260B**
1,1-Dichloroethene	**89**	**(80 - 120)**	**SW846 8260B**
Toluene	**95**	**(80 - 120)**	**SW846 8260B**
Trichloroethene	**88**	**(80 - 120)**	**SW846 8260B**
Chlorobenzene	**99**	**(80 - 120)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM1J21AC **Matrix.....:** WATER
LCS Lot-Sample#: G5J180000-444
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	**20.0**	**18.2**	**ug/L**	**91**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**17.8**	**ug/L**	**89**	**SW846 8260B**
Toluene	**20.0**	**18.9**	**ug/L**	**95**	**SW846 8260B**
Trichloroethene	**20.0**	**17.7**	**ug/L**	**88**	**SW846 8260B**
Chlorobenzene	**20.0**	**19.8**	**ug/L**	**99**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	107	(70 - 130)
1,2-Dichloroethane-d4	88	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM2P71AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**97**	**(80 - 120)**			**SW846 8260B**
	105	**(80 - 120)**	**7.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**89**	**(80 - 120)**			**SW846 8260B**
	102	**(80 - 120)**	**13**	**(0-30)**	**SW846 8260B**
Toluene	**102**	**(80 - 120)**			**SW846 8260B**
	108	**(80 - 120)**	**6.3**	**(0-30)**	**SW846 8260B**
Trichloroethene	**93**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**7.2**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**101**	**(80 - 120)**			**SW846 8260B**
	110	**(80 - 120)**	**8.2**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM2P71AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-173 HM2P71AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292173
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**20.0**	**19.5**	**ug/L**	**97**		**SW846 8260B**
	20.0	**21.0**	**ug/L**	**105**	**7.8**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**17.9**	**ug/L**	**89**		**SW846 8260B**
	20.0	**20.3**	**ug/L**	**102**	**13**	**SW846 8260B**
Toluene	**20.0**	**20.4**	**ug/L**	**102**		**SW846 8260B**
	20.0	**21.7**	**ug/L**	**108**	**6.3**	**SW846 8260B**
Trichloroethene	**20.0**	**18.7**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.1**	**ug/L**	**100**	**7.2**	**SW846 8260B**
Chlorobenzene	**20.0**	**20.3**	**ug/L**	**101**		**SW846 8260B**
	20.0	**22.0**	**ug/L**	**110**	**8.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	106	(70 - 130)
	109	(70 - 130)
1,2-Dichloroethane-d4	92	(70 - 130)
	93	(70 - 130)
Toluene-d8	109	(70 - 130)
	107	(70 - 130)
Dibromofluoromethane	99	(70 - 130)
	97	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292302
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**91**	**(80 - 120)**			**SW846 8260B**
	98	**(80 - 120)**	**7.8**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**80**	**(80 - 120)**			**SW846 8260B**
	96	**(80 - 120)**	**18**	**(0-30)**	**SW846 8260B**
Toluene	**93**	**(80 - 120)**			**SW846 8260B**
	101	**(80 - 120)**	**8.6**	**(0-30)**	**SW846 8260B**
Trichloroethene	**90**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**9.9**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**96**	**(80 - 120)**			**SW846 8260B**
	100	**(80 - 120)**	**3.6**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HM3AQ1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5J190000-302 HM3AQ1AD-LCSD
Prep Date.....: 10/18/05 **Analysis Date..:** 10/18/05
Prep Batch #...: 5292302
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**20.0**	**18.1**	**ug/L**	**91**		**SW846 8260B**
	20.0	**19.6**	**ug/L**	**98**	**7.8**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**15.9**	**ug/L**	**80**		**SW846 8260B**
	20.0	**19.1**	**ug/L**	**96**	**18**	**SW846 8260B**
Toluene	**20.0**	**18.5**	**ug/L**	**93**		**SW846 8260B**
	20.0	**20.2**	**ug/L**	**101**	**8.6**	**SW846 8260B**
Trichloroethene	**20.0**	**18.1**	**ug/L**	**90**		**SW846 8260B**
	20.0	**19.9**	**ug/L**	**100**	**9.9**	**SW846 8260B**
Chlorobenzene	**20.0**	**19.3**	**ug/L**	**96**		**SW846 8260B**
	20.0	**20.0**	**ug/L**	**100**	**3.6**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	111	(70 - 130)
	116	(70 - 130)
1,2-Dichloroethane-d4	113	(70 - 130)
	117	(70 - 130)
Toluene-d8	117	(70 - 130)
	123	(70 - 130)
Dibromofluoromethane	114	(70 - 130)
	121	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HL9L81AC-MS **Matrix.....:** WG
MS Lot-Sample #: G5J070276-007 HL9L81AD-MSD
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 10

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**108**	**(70 - 130)**			**SW846 8260B**
	110	**(70 - 130)**	**2.0**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**123**	**(70 - 130)**			**SW846 8260B**
	124	**(70 - 130)**	**1.6**	**(0-30)**	**SW846 8260B**
Toluene	**114**	**(70 - 130)**			**SW846 8260B**
	116	**(70 - 130)**	**1.5**	**(0-30)**	**SW846 8260B**
Trichloroethene	**103**	**(70 - 130)**			**SW846 8260B**
	105	**(70 - 130)**	**0.75**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**111**	**(70 - 130)**			**SW846 8260B**
	113	**(70 - 130)**	**2.2**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5J070276 **Work Order #...:** HL9L81AC-MS **Matrix.....:** WG
MS Lot-Sample #: G5J070276-007 HL9L81AD-MSD
Date Sampled...: 10/03/05 **Date Received..:** 10/06/05
Prep Date.....: 10/17/05 **Analysis Date..:** 10/17/05
Prep Batch #...: 5291444
Dilution Factor: 10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**200**	**215**	**ug/L**	**108**		**SW846 8260B**
	ND	**200**	**220**	**ug/L**	**110**	**2.0**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**200**	**245**	**ug/L**	**123**		**SW846 8260B**
	ND	**200**	**249**	**ug/L**	**124**	**1.6**	**SW846 8260B**
Toluene	**ND**	**200**	**228**	**ug/L**	**114**		**SW846 8260B**
	ND	**200**	**232**	**ug/L**	**116**	**1.5**	**SW846 8260B**
Trichloroethene	**280**	**200**	**489**	**ug/L**	**103**		**SW846 8260B**
	280	**200**	**493**	**ug/L**	**105**	**0.75**	**SW846 8260B**
Chlorobenzene	**ND**	**200**	**222**	**ug/L**	**111**		**SW846 8260B**
	ND	**200**	**227**	**ug/L**	**113**	**2.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	104	(70 - 130)
	111	(70 - 130)
1,2-Dichloroethane-d4	85	(70 - 130)
	90	(70 - 130)
Toluene-d8	101	(70 - 130)
	104	(70 - 130)
Dibromofluoromethane	92	(70 - 130)
	96	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

AUTOMATED DATA REVIEW SUMMARY

Facility:	SWMU 58
Event:	2004_2005 SWMU 58 Phase II RFI GW
Contract:	9T9H213C
Sample Delivery Group:	G5J070276
Field Contractor:	Parsons Engineering Science, Salt Lake City
Laboratory Contractor:	SEVERN TRENT LABS., WEST SACRAMENTO, CA
Data Review Contractor:	Synectics, Sacramento, CA
Guidance Document:	*Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003*

Analytical Method	Normal Samples	Field QC Samples
SW8260B	18	2

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistant with the requirements contained in Final Phase II RCRA Facility Investigation SWMU-58 Workplan, December 2003 to the extent possible. Where definitive guidance is not provided, data has been evaluated in a conservative manner using professional judgment. In cases where two qualifiers are listed as an action, such as "J/UJ", the first qualifier applies to positive results, and the second to non-detect results.

Samples were collected by Parsons Engineering Science, Salt Lake City; analyses were performed by SEVERN TRENT LABS., WEST SACRAMENTO, CA and were reported under sample delivery group (SDG) G5J070276. Results have been evaluated electronically using electronic data deliverables (EDDs) provided by the laboratory. The laboratory data summary forms (hard copy) have been reviewed during this effort and compared to the automated review output. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative. The following quality control elements were evaluated during this review effort:

Technical Holding Times
Continuing Calibration Verification
Method Blank Contamination
Field Blank Contamination
Blank Spike Accuracy
Blank Spike Precision
Matrix Spike Accuracy
Matrix Spike Precision
Surrogate Recovery
Laboratory Duplicate Precision
Field Duplicate Precision

A minimum of ten percent of sample and QC results were manually evaluated for compliance with project specific requirements and consistency with hard copy results. The following reports were generated during the evaluation of this data set and are presented as attachments to this report as applicable.

Data Submission Warnings – Warnings encountered during the data submission process are evaluated and their affect on data quality is discussed in the narrative.

Batch – The analytical batch report is reviewed for completeness and compliance with project specific requirements. Incomplete or non-compliant run sequences are identified and their impact on data quality are discussed in the narrative.

QC Outlier – Results exceeding the evaluation criteria are reviewed for compliance with project requirements and a minimum of ten percent of the non-compliant QC values reported electronically are verified for consistency with hard-copy values.

Qualified Results – Qualified results are evaluated for compliance with project requirements and ten percent of qualified results are verified for consistency with the QC Outlier Report.

Field Duplicate – Field duplicate comparison results are evaluated for compliance with project requirements and ten percent of values reported are verified for consistency with the hard-copy data.

Rejected Results – All rejected results are evaluated for compliance with project requirements. The reason for rejection of the data is verified against hard copy data.

Analytical deficiencies, project non-compliance issues and inconsistencies with hard copy results observed during ADR evaluation process and their impact on data quality are summarized in the ADR narrative.

Out of control events experienced by the laboratory have warranted the qualification of 2.6% (11 results) and the rejection of 0 % (0 results) of the data set. These deficiencies are detailed in the referenced attachments, and discussed in the ADR narrative, where appropriate.

Released by

Date

Reason and Comment Codes

Code	Definition
C1	Diluted Out
C2	Flag Parent Only
C2S	Flag Parent (Soil); Batch (Water)
C3	No Action
C4	No QC Outliers
C5	One or both values <5x RL
C6	Recalculated Value
C7	Material Blanks
C8	Spike Insignificant
C9	No Flags; set to ND by method/cal. blank

Reasons

Code	Definition
A	Serial dilution
B	Calibration Blank - Negative
	Negative Blank
B1	Blank
B2	Calibration Blank
C	Continuing Calibration Verification
	Continuing Calibration Verification RRF
D	BS RPD
	Field Duplicate RPD
D1	Lab Replicate RPD
D2	MS RPD
E	Exceeds LinearCalibration Range
F	Hydrocarbon pattern does not match standard
G	Initial Calibration RRF
	Initial Calibration RSD
H	Test Hold Time
	Prep Hold Time
I	Internal standard
K1	Equip Blank
K2	Field Blank
K3	Trip Blank
L	LCS Recovery
M	MS Recovery
N	Blank - No Action
O	Interference check sample
P	Column RPD
Q	Material Blank
S	Surrogate
T	Receipt Temperature
TI	Tentatively Identified Compound
TR	Trace Level Detect
W	Column breakdown (pesticides)
X	Raised reporting limit
Y	Analyte not confirmed on second column

ADR CASE NARRATIVE

Laboratory ID: G5J070276

Prior to loading and processing data, modifications to the project setup may be requested by the laboratory and/or contractor, and approved by the client. These modifications allow the loading of data that was not in complete agreement with the project guidance document; in some cases, variances to the project document may be in process, in others, the changes are required to accept data that had not been generated in compliance with the project guidance document. All project setup modifications are listed below:

There were no project setup modifications associated with this sample delivery group.

Chemistry Data Quality

The data submission process incorporates a series of stored procedures designed to identify conditions in electronic data deliverables (EDD) that would affect chemistry data quality. These conditions will not result in the qualification of the data; however, these findings should be reviewed for possible contractual non-compliance. A brief explanation of each finding encountered for this data set and the potential impact on chemistry data quality is summarized below.

There were no issues affecting chemistry data quality associated with this sample delivery group.

Data Verification

The data verification process includes a manual review of information on the chains of custody and laboratory case narratives, a check of all rejected results and a minimum of 10 percent of sample and QC results for consistency with hard copy reports, and a cursory review of all reports generated during the automated review process. The following comments are associated with the verification process:

1. **Volatiles by SW8260**

   An matrix spike (MS) was not provided on the EDD for the analytical batch for this SDG. No qualifiers have been applied on this basis.

   It was noted that the data flagging system could not determine the hold times for the reanalysis of samples C-45FD001, C-45GW002, C-45GW003, C-48FGW001, C-48FGW002, C-48FGW003, and C-48FGW004 due to 2 sets of surrogates being provided for the same samples. The data was manually reviewed and the reanalysis were found to be outside project warning limits. TCE was flagged as estimated as seen in the Qualified Results report.

All of the reports utilized during the data verification process are provided as attachments to this report.

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP101018	NA	NA	LABQC	WQ		HSL020	10/18/2005 1:56:00PM	CV6
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 3:31:00PM	BS1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 4:13:00PM	BD1
	5292302	NA	LABQC	WQ		G5J190000302	10/18/2005 5:14:00PM	LB1
	5292302	NA	D-18	WG	D-18GW009	G5J070276016	10/18/2005 5:48:00PM	N1
	5292302	NA	D-18	WG	D-18GW010	G5J070276017	10/18/2005 6:13:00PM	N1
	5292302	NA	D-18	WG	D-18GW011	G5J070276018	10/18/2005 6:37:00PM	N1
	5292302	NA	D-18	WG	D-18GW012	G5J070276019	10/18/2005 7:02:00PM	N1
HP71014	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV1
	NA	NA	LABQC	WQ		LCS SS	10/14/2005 5:57:00PM	CV3
HP71020	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AM	CV2
	NA	NA	LABQC	WQ		HSL020	10/20/2005 11:23:00AM	CV7
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AM	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 11:56:00AM	BS1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PM	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:24:00PM	BD1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PM	LB1
	5340483	NA	LABQC	WQ		G5L060000483	10/20/2005 12:52:00PM	LB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1
HP91006	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:22:00PM	CV1
	NA	NA	LABQC	WQ		LCS/SS	10/6/2005 6:45:00PM	CV2

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP91017	NA	NA	LABQC	WQ		HSL020	10/17/2005 12:00:00PM	CV4
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 12:36:00PM	BS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 2:49:00PM	MS1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 3:12:00PM	SD1
	5291444	NA	LABQC	WQ		G5J180000444	10/17/2005 3:58:00PM	LB1
	5291444	NA	C-45	WG	C-45GW001	G5J070276007	10/17/2005 4:20:00PM	N1
	5291444	NA	C-45	WG	C-45FD001	G5J070276006	10/17/2005 4:43:00PM	FD1
	5291444	NA	C-45	WG	C-45GW002	G5J070276008	10/17/2005 5:06:00PM	N1
	5291444	NA	C-45	WG	C-45GW003	G5J070276009	10/17/2005 5:29:00PM	N1
	5291444	NA	FIELDQC	WQ	PARSTB12	G5J070276020	10/17/2005 5:52:00PM	TB1
	5340483	NA	C-45	WG	C-45FD001	G5J070276006	10/20/2005 1:47:00PM	FD1
	5340483	NA	C-45	WG	C-45GW002	G5J070276008	10/20/2005 2:15:00PM	N1
	5340483	NA	C-45	WG	C-45GW003	G5J070276009	10/20/2005 2:43:00PM	N1
HP91018	NA	NA	LABQC	WQ		HSL020	10/18/2005 10:46:00AM	CV5
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:20:00AM	BS1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 11:57:00AM	BD1
	5292173	NA	LABQC	WQ		G5J190000173	10/18/2005 12:43:00PM	LB1
	5292173	NA	D-19	WG	D-19FD001	G5J070276001	10/18/2005 4:46:00PM	N1
	5292173	NA	D-19	WG	D-19GW001	G5J070276002	10/18/2005 5:09:00PM	N1
	5292173	NA	D-19	WG	D-19GW002	G5J070276003	10/18/2005 5:32:00PM	N1
	5292173	NA	D-19	WG	D-19GW003	G5J070276004	10/18/2005 5:55:00PM	N1
	5292173	NA	D-17	WG	D-17GW001	G5J070276005	10/18/2005 6:18:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW001	G5J070276010	10/18/2005 6:41:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW002	G5J070276011	10/18/2005 7:03:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW003	G5J070276012	10/18/2005 7:27:00PM	N1
	5292173	NA	C-48F	WG	C-48FGW004	G5J070276013	10/18/2005 7:49:00PM	N1
	5292173	NA	D-18	WG	D-18GW007	G5J070276014	10/18/2005 8:12:00PM	N1

Batch Report

Facility: SWMU 58
Lab: SVLS
Filename: G5J070276
Status: Certified - 12/12/2005
User: BonnieMcNeill

Test Method: SW8260B
Leach Method: NONE

Test Batch	Prep Batch	Leach Batch	Location	Matrix	Field Sample ID	Lab Sample ID	Test Date and Time	Sample Type
HP91018	5292173	NA	D-18	WG	D-18GW008	G5J070276015	10/18/2005 8:35:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW004	G5J070276013	10/20/2005 3:11:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW001	G5J070276010	10/20/2005 3:38:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW002	G5J070276011	10/20/2005 4:06:00PM	N1
	5340483	NA	C-48F	WG	C-48FGW003	G5J070276012	10/20/2005 4:34:00PM	N1

QC Outliers

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: 9T9H213C

SDG G5J070276

Test/Leach	QCElement	Sample	Type	Dil'n	Analyte	Result	Units	Warning Limits	Control Limits	Qualifier	Reason	Cmnt.
SW8260B/NONE	Fld. RPD	C-45FD001	FD1	10.00	Trichloroethene (TCE)	38	RPD	<25	< 25	None	D	C2
SW8260B/NONE	LCS %R	P5292302LABQC	BS1	1.00	1,1-Dichloroethene	80	%	80 - 120	10 - 120	J / UJ	L	

Detected Results

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Carbon Tetrachloride	1.0	3.4		3.4		UG/L	
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32	J	0.32	J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190		190	J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4	J	3.4	J	UG/L	TR
SW8260B/NONE	WG	C-45GW001	N	Trichloroethene (TCE)	10	280		280		UG/L	
SW8260B/NONE	WG	C-45GW002	N	Carbon Tetrachloride	1.0	3.2		3.2		UG/L	
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35	J	0.35	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200		200	J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Carbon Tetrachloride	1.0	3.0		3.0		UG/L	
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29	J	0.29	J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180		180	J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	1,1-Dichloroethene	1.0	1.2		1.2		UG/L	
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39	J	0.39	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63	J	0.63	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10	J	0.10	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360		360	J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	1,1-Dichloroethene	1.0	1.1		1.1		UG/L	
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44	J	0.44	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48	J	0.48	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340		340	J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	1,1-Dichloroethene	1.0	1.1		1.1		UG/L	
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33	J	0.33	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50	J	0.50	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12	J	0.12	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320		320	J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13	J	0.13	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethene	1.0	1.2		1.2		UG/L	

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36	J	0.36	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56	J	0.56	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300		300	J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43	J	0.43	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-18GW007	N	Trichloroethene (TCE)	1.0	5.0		5.0		UG/L	
SW8260B/NONE	WG	D-18GW008	N	Trichloroethene (TCE)	1.0	4.4		4.4		UG/L	
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15	J	0.15	J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	Trichloroethene (TCE)	1.0	3.9		3.9		UG/L	
SW8260B/NONE	WG	D-18GW010	N	Trichloroethene (TCE)	1.0	3.7		3.7		UG/L	
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16	J	0.16	J	UG/L	TR
SW8260B/NONE	WG	D-18GW011	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-18GW012	N	Trichloroethene (TCE)	1.0	3.8		3.8		UG/L	
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66	J	0.66	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22	J	0.22	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Trichloroethene (TCE)	1.0	5.9		5.9		UG/L	
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57	J	0.57	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25	J	0.25	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Trichloroethene (TCE)	1.0	6.0		6.0		UG/L	
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76	J	0.76	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20	J	0.20	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Trichloroethene (TCE)	1.0	6.3		6.3		UG/L	
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73	J	0.73	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23	J	0.23	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Trichloroethene (TCE)	1.0	6.6		6.6		UG/L	

Qualified Results

Facility: SWMU 58
Event: 2004_2005 SWMU 58 Phase II RFI GW
Reference: ISSS-539-01

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	C-45FD001	FD	Chloroform	1.0	0.32	J	0.32	J	UG/L	TR
SW8260B/NONE	WG	C-45FD001	FD	Trichloroethene (TCE)	10	190		190	J	UG/L	H
SW8260B/NONE	WG	C-45GW001	N	Carbon Tetrachloride	10	3.4	J	3.4	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Chloroform	1.0	0.35	J	0.35	J	UG/L	TR
SW8260B/NONE	WG	C-45GW002	N	Trichloroethene (TCE)	10	200		200	J	UG/L	H
SW8260B/NONE	WG	C-45GW003	N	Chloroform	1.0	0.29	J	0.29	J	UG/L	TR
SW8260B/NONE	WG	C-45GW003	N	Trichloroethene (TCE)	10	180		180	J	UG/L	H
SW8260B/NONE	WG	C-48FGW001	N	Carbon Tetrachloride	1.0	0.39	J	0.39	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Chloroform	1.0	0.63	J	0.63	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	cis-1,2-Dichloroethylene	1.0	0.10	J	0.10	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW001	N	Trichloroethene (TCE)	20	360		360	J	UG/L	H
SW8260B/NONE	WG	C-48FGW002	N	Carbon Tetrachloride	1.0	0.44	J	0.44	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Chloroform	1.0	0.48	J	0.48	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW002	N	Trichloroethene (TCE)	20	340		340	J	UG/L	H
SW8260B/NONE	WG	C-48FGW003	N	Carbon Tetrachloride	1.0	0.33	J	0.33	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Chloroform	1.0	0.50	J	0.50	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	cis-1,2-Dichloroethylene	1.0	0.12	J	0.12	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW003	N	Trichloroethene (TCE)	20	320		320	J	UG/L	H
SW8260B/NONE	WG	C-48FGW004	N	1,1-Dichloroethane	1.0	0.13	J	0.13	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Carbon Tetrachloride	1.0	0.36	J	0.36	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Chloroform	1.0	0.56	J	0.56	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	cis-1,2-Dichloroethylene	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	C-48FGW004	N	Trichloroethene (TCE)	10	300		300	J	UG/L	H
SW8260B/NONE	WG	D-17GW001	N	Carbon Tetrachloride	1.0	0.43	J	0.43	J	UG/L	TR
SW8260B/NONE	WG	D-17GW001	N	Chloroform	1.0	0.18	J	0.18	J	UG/L	TR
SW8260B/NONE	WG	D-18GW009	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW009	N	Carbon Tetrachloride	1.0	0.15	J	0.15	J	UG/L	TR

SDG: G5J070276

Volatile Organic Compounds by Capillary GC/MS

Test/Leach	Matrix	Field Sample ID	Type	Analyte	RL	Lab Result		Qualified Result		Units	Reason
SW8260B/NONE	WG	D-18GW010	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-18GW011	N	Carbon Tetrachloride	1.0	0.16	J	0.16	J	UG/L	TR
SW8260B/NONE	WG	D-18GW012	N	1,1-Dichloroethene	1.0	1.0	U	1.0	UJ	UG/L	L
SW8260B/NONE	WG	D-19FD001	N	Carbon Tetrachloride	1.0	0.66	J	0.66	J	UG/L	TR
SW8260B/NONE	WG	D-19FD001	N	Chloroform	1.0	0.22	J	0.22	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Carbon Tetrachloride	1.0	0.57	J	0.57	J	UG/L	TR
SW8260B/NONE	WG	D-19GW001	N	Chloroform	1.0	0.25	J	0.25	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Carbon Tetrachloride	1.0	0.76	J	0.76	J	UG/L	TR
SW8260B/NONE	WG	D-19GW002	N	Chloroform	1.0	0.20	J	0.20	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Carbon Tetrachloride	1.0	0.73	J	0.73	J	UG/L	TR
SW8260B/NONE	WG	D-19GW003	N	Chloroform	1.0	0.23	J	0.23	J	UG/L	TR

DATA MANAGEMENT NARRATIVE

Laboratory ID: G5J070276

Data Submission

The data submission process incorporates a series of stored procedures designed to identify valid value (VVL), logical (LE), and project specific errors (PSE) in electronic data deliverables (EDD). Automated data review (ADR) is most efficient when data generators correct all errors. Dependent primarily upon the electronic reporting capabilities of the data generator, the severity of the logical and project specific errors listed below have been reduced to warnings. A warning log is generated with each data submission and is presented as an attachment to this report. A brief explanation of each error encountered for this data set and the potential impact on data quality is summarized below.

1. **Logical Error (LE) spLE01_ANADATE_Unique**
   This logical error occurs when multiple analyses are submitted within the same analytical batch that have identical analysis dates and times. This occurs in the laboratory when instruments are able to perform analyses in less than one minute, as ERPIMS specification records time only to the minute. However, it can also occur if the time of analysis is not recorded by an instrument, and the laboratory analyst reports all measurements in a batch with the same time. Whenever possible, actual times of analysis should be recorded and reported.

2. **Project Specific Error (PSE) spPSE01L_Invalid_Units_QC**
   This PSE occurs when laboratory quality control samples are reported with units of percent as opposed to true values. This inconsistency does not affect data quality, unless the submittal is scheduled for delivery to the AFCEE in accordance with the ERPIMS 4.0 specification. Automated data review can be performed for laboratory QC when units are reported in percent or in concentration units. However, to avoid this warning on future submittals, the laboratory would need to report these values in units of concentration (i.e., ug/L).

3. **Logical Error (LE) spLE01_QAPPFLAGS_F**
   This LE warning occurs when there are positive results less than the RL and associated QAPPFLAGS are not “F”. This requirement is only necessary if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply QAPPFLAGS of “F” whenever the detected result is less than the RL.

4. **Valid Value List (VVL) spVVL32_LABLOTCTL**
   This warning occurs when the laboratory does not include the preparation batch number (LABLOTCTL). The LABLOTCTL field should be populated with the same ID for all field and QC samples extracted/prepared in the same batch. To avoid this warning on future submittals, populate the LABLOTCTL field.

5. **Valid Value List (VVL) spVVL33_CALREFID**
   This valid value warning occurs when the laboratory does not include the calibration reference ID (CALREFID). To avoid this warning in the future, the laboratory should include the CALREFID on the electronic data.

6. **Valid Value List (VVL) spVVL56_QAPPFLAGS**
   This valid value warning occurs when there are QAPPFLAGS in the file that are not official AFCEE qualifiers. Using the official AFCEE qualifiers is necessary only if the project is an AFCEE project or if the data is to be submitted to ERPIMS. To avoid this warning in the future, apply only AFCEE qualifiers to the QAPPFLAGS field.

A detailed description of the stored procedures utilized during the data submission process is provided as an attachment to this report (Submission Warnings).

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

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LE

Query Name	Finding	Record Count
spLE01_ANADATE_Unique	ANMCODE is SW8260B; ANADATE is Oct 20 2005 11:23AM; ANALOT is HP71020	2
	ANMCODE is SW8260B; ANADATE is Oct 14 2005 5:57PM; ANALOT is HP71014	2

PSE

Query Name	Finding	Record Count
spPSE01L_Invalid_Units_QC	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is N/STD; UNITS is percent	87
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BD/STD; UNITS is percent	9
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is MS/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is FD/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is SD/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/ORG; UNITS is PERCENT	106
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is CV/STD; UNITS is percent	27
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is BS/STD; UNITS is percent	12
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is TB/STD; UNITS is percent	3
	ANMCODE is SW8260B; LCHMETH is NONE; Matrix Class is W; SACODE/PRCCODE is LB/STD; UNITS is percent	12

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.3300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 3.4000; RL is 10.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5600; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

---

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2900; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3200; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.7300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2500; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.5700; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.6300; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.3600; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.1000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.4800; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2000; RL is 1.0000; QAPPFLAGS is J	1
	PARVQ is TR; PARVAL is 0.2200; RL is 1.0000; QAPPFLAGS is J	1

Submission Warnings

Facility: SWMU 58
Data Generator: SVLS
File Name: N:\Temp Data\Parsons\Tooelle\G5J070276\G5J070276.txt

VVL

Query Name	Finding	Record Count
spLE01_QAPPFLAGS_F	PARVQ is TR; PARVAL is 0.1800; RL is 1.0000; QAPPFLAGS is J	2
	PARVQ is TR; PARVAL is 0.4400; RL is 1.0000; QAPPFLAGS is J	1
spVVL32_LABLOTCTL	LABLOTCTL is Null	133
spVVL33_CALREFID	CALREFID is Null	655
spVVL56_QAPPFLAGS	QAPPFLAGS is Uq	1

Total Record Count: 788
Error Count: 0
Warning Count: 1,103

APPENDIX G

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: **Dean Reynolds, TEAD; Larry McFarland, TEAD**

Copy: **Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons**

From: **Amanda Evans, Parsons**

Date: **Tuesday, August 16, 2005**

Subject: **TEAD SWMU-58 RFI – Waste Management**

This letter is to recommend disposition of the waste soil in PARSNZ0520201 through PARSNZ0520203 in three 55 gallon drums as detailed in Table One, attached. The waste was generated in association with well C-45.

The soils were sampled as IDW58 and tested for TCLP VOCs. Analysis was conducted by Severn Trent Services, Inc, West Sacramento, CA. This laboratory is Utah Certified.

Results have been received as an analytical report and quality control (QC) summary. Parsons has reviewed the data and found the QC to be acceptable. The complete report is attached.

Listed Wastes Analysis:

No constituents were detected.

Therefore it is recommended that waste be treated as non-hazardous with respect to listed codes.

Characteristic Wastes Analysis:

The waste is known to be primarily soil. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No constituents were detected. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Land Disposal Restrictions Analysis:

No constituents were detected (40 CFR Part 268.48), therefore LDRs do not apply.

Disposition:

Recommendations for disposal of the soil are to dispose at the drill site from which the soil originated on the ground around the monitoring well. Parsons will arrange to dispose of the waste per your written instructions.

Table One

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0520201	KLA	YES		55 GAL	C-45	SOIL	7/21/2005	7/21/2005	7/21/2005	**10/9/2005**			

Sites	Location	Move Date	Manifest ID	Manifest Date
C-45	UID-90	7/21/2005		
	C-45	7/21/2005		

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0520202	KLA	YES		55 GAL	C-45	SOIL	7/21/2005	7/21/2005	7/21/2005	**10/9/2005**			

Sites	Location	Move Date	Manifest ID	Manifest Date
C-45	UID-90	7/21/2005		
	C-45	7/21/2005		

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0520203	KLA	YES		55 GAL	C-45	SOIL	7/21/2005	7/21/2005	7/21/2005	**10/9/2005**			

Sites	Location	Move Date	Manifest ID	Manifest Date
C-45	C-45	7/21/2005		
	UID-90	7/21/2005		

From: McFarland, Larry [larry.mcfarland@us.army.mil]
Sent: Wednesday, August 17, 2005 12:21 PM
To: Evans, Amanda
Cc: Alloway, Kurt; Jirik, Richard
Subject: RE: TEAD IDW Report for IDW58

Amanda,

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated August 16, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample number IDW58. TEAD concurs with Parsons recommended disposition. Based on the analysis provided, the soil cuttings contained in the following containers should be returned to the point of generation (monitoring wells C-45), and spread on the surface surrounding the respective monitoring well.

PARSNZ0520201
PARSNZ0520202
PARSNZ0520203

Thanks
Larry M.

-----Original Message-----
From: Evans, Amanda [mailto:Amanda.Evans@parsons.com]
Sent: Tuesday, August 16, 2005 2:15 PM
To: Kurt.Alloway@parsons.com; colec@emh2.tooele.army.mil; doug.d.mackenzie@usace.army.mil; Richard.Jirik@parsons.com; Maryellen.Mackenzie@usace.army.mil; mcfarlal@emh2.tooele.army.mil; reynoldd@emh2.tooele.army.mil
Subject: TEAD IDW Report for IDW58

<<AME_idw58.pdf>>
Hello,

You will find attached the report for IDW58. Note that the drum numbers listed on the chain of custody do not match those listed in Table One of the memo. This is because the soil sample was taken and sent to the lab before the water in the drums had been decanted. Once this had been done, it was found that drums PARSNZ0520204 through PARSNZ0520206 only contained water. These three drums of water were transferred into the Baker tank associated with PARSNZ0520801and will be sampled as water waste at a later date. If you have any questions concerning this discrepancy please contact Kurt Alloway. Please contact me if you have any further questions or comments.

Thank you,

Amanda M. Evans
Chemist
parsons
406 West South Jordan Parkway, Suite 300
South Jordan, UT 84095
(801)553-3366
(801)572-9069 Fax

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

August 12, 2005

STL SACRAMENTO PROJECT NUMBER: G5G270254
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on July 27, 2005. This sample is associated with your Tooelle Industrial Area project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were sent via e-mail on August 11, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5G270254

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5G270254

General Comments

Sample was received at 2 degrees Centigrade. It was sent to STL North Canton on 7/27/05 where it was received at 3.3 degrees Centigrade.

SOLID, SW 1311/8260B, TCLP/Volatile Organics

Sample(s): 1

Samples were analysed by method SW 1311/8260B, a TCLP extraction followed by gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met.

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5G270254

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HGC9R	1	IDW58	7/25/2005 04:30 PM	7/27/2005 09:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

CHAIN OF CUSTODY

PARSONS

COC ID: 986

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW58	IDW58	SD	G	N	1	25-JUL-2005	1630	KLA	0	169	2

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
TCLPVOC	SVLS					

Remarks: PARSN2052020I-06
C-45 CUTTINGS

5 DAY TURN-AROUND REQUESTED

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
TO FEDEX	26 JUL 05 1500		7/27/05 11:2

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Monday, July 25, 2005

Severn Trent Laboratories, Inc
SAMPLE ANALYSIS REQUISITION

✓ Am 8/1/05.

LABORATORY: STL N Canton
4101 Shuffel Drive NW
North Canton OH 44720,

NEED ANALYTICAL REPORT BY
7/31/05

C185 Am 7/28/05
Printed MS worksheets

ATTN:

LAB PURCHASE ORDER: SR070997

CLIENT CODE: 368391 PROJECT MANAGER: Nilo Ligi

NUMBER OF SAMPLES IN LOT: 0001

SAMPLE I.D.	SAMPLING DATE	ANALYSIS REQUIRED
G5G270254-001 HGC9R-1-AA	7/25/05	Volatile Organics, GC/MS (8260B) (MS8260TP) METHOD: 8260B

2X250

NEED DETECTION LIMIT AND ANALYSIS DATE INCLUDED IN REPORT.

SHIPPING METHOD: DATE: 7/27/05

SEND REPORT TO:

SAMPLE RECEIVED BY: _____ DATE: _____

PLEASE SEND A SIGNED COPY OF THIS FORM WITH REPORT AT COMPLETION OF ANALYSIS.

THANK YOU.

STL Sacramento
INT: _____ 7/27/05 13:10:29
STL N Canton
4101 Shuffel Drive NW
North Canton OH 44720,

RELINQUISHED BY: _____ DATE/TIME: 5.27.05 1300

RELINQUISHED BY: _____ DATE/TIME: _____

RECEIVED FOR LAB BY: _____ DATE/TIME: 7/28/05 9:30 Am

PLEASE RETURN ORIGINAL SAMPLE ANALYSIS REQUISITION

SEVERN TRENT **STL**

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Ramona PM ML LOG # 33723

LOT# (QUANTIMS ID) G5G270254 QUOTE# 62837 LOCATION WAG

		Initials	Date
DATE RECEIVED	7/27/05 TIME RECEIVED 9:00	AM	7/27/05

DELIVERED BY
- ☑ FEDEX
- ☐ CA OVERNIGHT
- ☐ CLIENT
- ☐ AIRBORNE
- ☐ GOLDENSTATE
- ☐ DHL
- ☐ UPS
- ☐ BAX GLOBAL
- ☐ GO-GETTERS
- ☐ STL COURIER
- ☐ COURIERS ON DEMAND
- ☐ OTHER

CUSTODY SEAL STATUS ☑ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) N/A

SHIPPPING CONTAINER(S) ☐ STL ☑ CLIENT ☐ N/A

TEMPERTURE RECORD (IN °C) IR 1☐ 3☑ ☐ OTHER

COC #(S) N/A

TEMPERATURE BLANK Observed: N/A Corrected: N/A

SAMPLE TEMPERATURE
Observed: 2 2 2 Average: 2 Corrected Average: N/A

COLLECTOR'S NAME: ☐ Verified from COC ☑ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW _____ ☑ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING
- WETCHEM ☑ N/A
- VOA-ENCORES ☑ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A

☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☑ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

STL Cooler Receipt Form/Narrative **Lot Number:** G5G270254

North Canton Facility

Client: STL-Sac Project: Quote#:

Cooler Received on: 7/28/05 Opened on: 7/28/05 by: (Signature)

Fedx [X] Client Drop Off [ ] UPS [ ] DHL [ ] FAS [ ] Other:

STL Cooler No# Foam Box [ ] Client Cooler [X] Other

1. Were custody seals on the outside of the cooler? Yes [X] No [ ] Intact? Yes [X] No [ ] NA [ ]
   If YES, Quantity 1
   Were the custody seals signed and dated? Yes [X] No [ ] NA [ ]
2. Shipper's packing slip attached to this form? Yes [X] No [ ] NA [ ]
3. Did custody papers accompany the samples? Yes [X] No [ ] Relinquished by client? Yes [X] No [ ]
4. Did you sign the custody papers in the appropriate place? Yes [X] No [ ]
5. Packing material used: Bubble Wrap [X] Foam [ ] None [ ] Other :
6. Cooler temperature upon receipt 3.3 °C (see back of form for multiple coolers/temp)

METHOD: Temp Vial [ ] Coolant & Sample [ ] Against Bottles [ ] IR [X] ICE/$H_2$0 Slurry [ ]

COOLANT: Wet Ice [X] Blue Ice [ ] Dry Ice [ ] Water [ ] None [ ]

7. Did all bottles arrive in good condition (Unbroken)? Yes [X] No [ ]
8. Could all bottle labels and/or tags be reconciled with the COC? Yes [X] No [ ]
9. Were samples at the correct pH? (record below/on back) Yes [ ] No [ ] NA [X]
10. Were correct bottles used for the tests indicated? Yes [X] No [ ]
11. Were air bubbles >6 mm in any VOA vials? Yes [ ] No [ ] NA [X]
12. Sufficient quantity received to perform indicated analyses? Yes [X] No [ ]

Contacted PM Date: by: via Voice Mail [ ] Verbal [ ] Other [ ]

Concerning:

√	

1. CHAIN OF CUSTODY

The following discrepancies occurred:

2. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

3. SAMPLE PRESERVATION

Sample(s) were further preserved in sample receiving to meet recommended pH level(s). *Nitric Acid Lot # 051105-HNO3; Sulfuric Acid Lot # 102804-H2SO4; Sodium Hydroxide Lot # -041305 -NaOH; Hydrochloric Acid Lot # 100504-HCl; Sodium Hydroxide and Zinc Acetate Lot # 071604-CH3COO2ZN/NaOH*

Sample(s) were received with bubble > 6 mm in diameter (cc: PM)

4. Other (see below or back)

Client ID	pH	Date	Initials

SOP: NC-SC-0005, Sample Receiving
N:\QAQC\NARRATIV\STL\Cooler Receipt STL\COOLER_STL_Rev49 062205.doc

Saturated Drill Cuttings Analytical Results

Parsons Corporation

Client Sample ID: IDW58

TCLP GC/MS Volatiles

Lot-Sample #...: G5G270254-001	**Work Order #...:** HGC9R1AA	**Matrix.....:** SOLID
Date Sampled...: 07/25/05	**Date Received..:** 07/27/05	
Leach Date.....: 08/08/05	**Prep Date.....:** 08/10/05	**Analysis Date..:** 08/10/05
Leach Batch #..: P522011	**Prep Batch #...:** 5222474	
Dilution Factor: 1		
	Method.....: SW846 8260B	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	0.025	mg/L	0.00023
Carbon tetrachloride	ND	0.025	mg/L	0.00045
Chlorobenzene	ND	0.025	mg/L	0.00028
Chloroform	ND	0.025	mg/L	0.00040
1,2-Dichloroethane	ND	0.025	mg/L	0.00048
1,1-Dichloroethylene	ND	0.070	mg/L	0.00060
Methyl ethyl ketone	ND	0.25	mg/L	0.0010
Tetrachloroethylene	ND	0.070	mg/L	0.00083
Trichloroethylene	ND	0.050	mg/L	0.00041
Vinyl chloride	ND	0.025	mg/L	0.00044

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(86 - 125)
1,2-Dichloroethane-d4	103	(80 - 122)
Toluene-d8	100	(90 - 122)
4-Bromofluorobenzene	92	(84 - 125)

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

QC DATA ASSOCIATION SUMMARY

G5G270254

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	SW846 8260B	P522011	5222474	5222328

METHOD BLANK REPORT

TCLP GC/MS Volatiles

Client Lot #...: G5G270254 **Work Order #...:** HG5DV1AA **Matrix.....:** SOLID
MB Lot-Sample #: A5H080000-170
Leach Date.....: 08/08/05 **Prep Date.....:** 08/10/05 **Analysis Date..:** 08/10/05
Leach Batch #..: P522011 **Prep Batch #...:** 5222474
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	0.025	mg/L	SW846 8260B
Carbon tetrachloride	ND	0.025	mg/L	SW846 8260B
Chlorobenzene	ND	0.025	mg/L	SW846 8260B
Chloroform	ND	0.025	mg/L	SW846 8260B
1,2-Dichloroethane	ND	0.025	mg/L	SW846 8260B
1,1-Dichloroethylene	ND	0.070	mg/L	SW846 8260B
Methyl ethyl ketone	ND	0.25	mg/L	SW846 8260B
Tetrachloroethylene	ND	0.070	mg/L	SW846 8260B
Trichloroethylene	ND	0.050	mg/L	SW846 8260B
Vinyl chloride	ND	0.025	mg/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(86 - 125)
1,2-Dichloroethane-d4	98	(80 - 122)
Toluene-d8	98	(90 - 122)
4-Bromofluorobenzene	87	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5G270254 **Work Order #...:** HHAK81AA **Matrix.....:** SOLID
LCS Lot-Sample#: A5H100000-474
Prep Date.....: 08/10/05 **Analysis Date..:** 08/10/05
Prep Batch #...: 5222474
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Benzene	**92**	**(76 - 118)**	**SW846 8260B**
Chlorobenzene	**92**	**(76 - 113)**	**SW846 8260B**
1,1-Dichloroethylene	**86**	**(67 - 128)**	**SW846 8260B**
Trichloroethylene	**95**	**(76 - 119)**	**SW846 8260B**
Toluene	**91**	**(72 - 117)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(86 - 124)
1,2-Dichloroethane-d4	105	(80 - 122)
Toluene-d8	105	(90 - 122)
4-Bromofluorobenzene	96	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5G270254 **Work Order #...:** HHAK81AA **Matrix.....:** SOLID
LCS Lot-Sample#: A5H100000-474
Prep Date.....: 08/10/05 **Analysis Date..:** 08/10/05
Prep Batch #...: 5222474
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	**0.500**	**0.462**	**mg/L**	**92**	**SW846 8260B**
Chlorobenzene	**0.500**	**0.458**	**mg/L**	**92**	**SW846 8260B**
1,1-Dichloroethylene	**0.500**	**0.431**	**mg/L**	**86**	**SW846 8260B**
Trichloroethylene	**0.500**	**0.474**	**mg/L**	**95**	**SW846 8260B**
Toluene	**0.500**	**0.455**	**mg/L**	**91**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(86 - 124)
1,2-Dichloroethane-d4	105	(80 - 122)
Toluene-d8	105	(90 - 122)
4-Bromofluorobenzene	96	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP GC/MS Volatiles

Client Lot #...: G5G270254 **Work Order #...:** HGTLF1A3-MS **Matrix.....:** SOLID
MS Lot-Sample #: A5H030179-023 HGTLF1A4-MSD
Date Sampled...: 08/01/05 **Date Received..:** 08/03/05
Leach Date.....: 08/08/05 **Prep Date.....:** 08/10/05 **Analysis Date..:** 08/10/05
Leach Batch #..: P522011 **Prep Batch #...:** 5222474
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**89**	**(76 - 117)**			**SW846 8260B**
	89	**(76 - 117)**	**0.71**	**(0-30)**	**SW846 8260B**
Chlorobenzene	**87**	**(72 - 114)**			**SW846 8260B**
	86	**(72 - 114)**	**0.69**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethylene	**81**	**(67 - 129)**			**SW846 8260B**
	79	**(67 - 129)**	**1.8**	**(0-30)**	**SW846 8260B**
Trichloroethylene	**95**	**(72 - 121)**			**SW846 8260B**
	91	**(72 - 121)**	**4.4**	**(0-30)**	**SW846 8260B**
Toluene	**92**	**(67 - 113)**			**SW846 8260B**
	88	**(67 - 113)**	**4.3**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	103	(86 - 125)
	97	(86 - 125)
1,2-Dichloroethane-d4	102	(80 - 122)
	103	(80 - 122)
Toluene-d8	102	(90 - 122)
	102	(90 - 122)
4-Bromofluorobenzene	96	(84 - 125)
	95	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

TCLP GC/MS Volatiles

Client Lot #...: G5G270254 **Work Order #...:** HGTLF1A3-MS **Matrix.....:** SOLID
MS Lot-Sample #: A5H030179-023 HGTLF1A4-MSD
Date Sampled...: 08/01/05 **Date Received..:** 08/03/05
Leach Date.....: 08/08/05 **Prep Date.....:** 08/10/05 **Analysis Date..:** 08/10/05
Leach Batch #..: P522011 **Prep Batch #...:** 5222474
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**0.500**	**0.443**	**mg/L**	**89**		**SW846 8260B**
	ND	**0.500**	**0.446**	**mg/L**	**89**	**0.71**	**SW846 8260B**
Chlorobenzene	**ND**	**0.500**	**0.433**	**mg/L**	**87**		**SW846 8260B**
	ND	**0.500**	**0.430**	**mg/L**	**86**	**0.69**	**SW846 8260B**
1,1-Dichloroethylene	**ND**	**0.500**	**0.404**	**mg/L**	**81**		**SW846 8260B**
	ND	**0.500**	**0.397**	**mg/L**	**79**	**1.8**	**SW846 8260B**
Trichloroethylene	**ND**	**0.500**	**0.474**	**mg/L**	**95**		**SW846 8260B**
	ND	**0.500**	**0.454**	**mg/L**	**91**	**4.4**	**SW846 8260B**
Toluene	**ND**	**0.500**	**0.472**	**mg/L**	**92**		**SW846 8260B**
	ND	**0.500**	**0.452**	**mg/L**	**88**	**4.3**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	103	(86 - 125)
	97	(86 - 125)
1,2-Dichloroethane-d4	102	(80 - 122)
	103	(80 - 122)
Toluene-d8	102	(90 - 122)
	102	(90 - 122)
4-Bromofluorobenzene	96	(84 - 125)
	95	(84 - 125)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

APPENDIX H

PARSONS

406 West South Jordan Parkway, Suite 300 • South Jordan, Utah 84095 • (801) 572-5999 • Fax (801) 572-9069

Memorandum

To: **Dean Reynolds, TEAD; Larry McFarland, TEAD**

Copy: **Maryellen Mackenzie, USACE; Carl Cole, USACE; Doug Mackenzie, USACE; Richard Jirik, Parsons; Kurt Alloway, Parsons**

From: **Amanda Evans, Parsons**

Date: **Friday, September 2, 2005**

Subject: **TEAD SWMU-58 RFI – Waste Management**

This letter is to recommend disposition of the waste equipment rinsate and drill produced water in Baker Tank PARSNZ0520801 as detailed in Table One, attached.

The equipment rinsate and drill produced water was sampled as IDW61 and tested for VOCs. Analysis was conducted by Severn Trent Services, Inc, West Sacramento, CA. This laboratory is Utah Certified.

Results have been received as an analytical report and quality control (QC) summary. Parsons has reviewed the data and found the QC to be acceptable. The complete report is attached.

Listed Wastes Analysis:

Naphthalene was detected at 0.31 ug/L, toluene at 0.44 ug/L and trichloroethylene at 48 ug/L. Therefore it is recommended that the waste be treated as hazardous and coded F001 and F005. Also, chloroform was detected at 0.13 ug/L. No additional waste codes are recommended due to chloroform.

Characteristic Wastes Analysis:

The waste is known to be primarily water. Therefore generator's reasonable knowledge may be used to exclude the characteristics of ignitability, reactivity and corrosivity.

No analytes were detected in excess of TCLP limits. Therefore no characteristic waste codes (40 CFR Part 261.24) should be applied.

Land Disposal Restrictions Analysis:

No compounds were detected in excess of LDR limits for wastewater (40 CFR Part 268.48), therefore the waste is suitable for land disposal.

Disposition:

It is recommended that the equipment rinsate and drill produced water be sent to Clean Harbors and landfilled under the active profile number: CH91899B. No additional profile sampling will be required if this facility is utilized. Parsons will arrange to dispose of the waste per your written instructions.

Table One

Container ID	Owner	Sample?	Sample Comment	Container Size	Source	Contents	Open Date	Close Date	Accumulation Start Date	Disposition Due	Determination	Disposition	Disposition Date
PARSNZ0520801	KLA	YES		6500 GAL	C-45, C-47, C-48F	PURGE WATER, DECON WATER	7/27/2005	8/18/2005	7/27/2005	**10/15/2005**			

Sites	Location	Move Date	Manifest ID	Manifest Date
C-45	UID-90	7/27/2005		
C-47				
C-48				
UID				

From: McFarland, Larry [larry.mcfarland@us.army.mil]
Sent: Wednesday, September 07, 2005 3:23 PM
To: Evans, Amanda
Cc: Alloway, Kurt; Dean Reynolds (TEAD)
Subject: RE: TEAD IDW Report for IDW61
Amanda,

The Tooele Army Depot (TEAD) Environmental Office has reviewed your memorandum dated September 2, 2005 concerning the recommended disposition of Investigative Derived Waste (IDW) which has been characterized for disposal through sample number IDW-61. TEAD concurs with Parsons recommended disposition. Water contained in the Baker Tank (PARSNZ0520801) should be disposed of off-site as recommended by Parsons as soon as possible. A copy of the shipping documents should be provided to TEAD for review prior to pickup by the transporter.

Larry McFarland
Environmental Office, SJMTE-CS-EO
1 Tooele Army Depot, Building 8
Tooele, Utah 84074-5003
Phone (435) 833-3235 Fax (435) 833-2839
larry.mcfarland@us.army.mil

-----Original Message-----
From: Evans, Amanda [mailto:Amanda.Evans@parsons.com]
Sent: Friday, September 02, 2005 10:54 AM
To: Kurt.Alloway@parsons.com; colec@emh2.tooele.army.mil; doug.d.mackenzie@usace.army.mil; Richard.Jirik@parsons.com; Maryellen.Mackenzie@usace.army.mil; mcfarlal@emh2.tooele.army.mil; reynoldd@emh2.tooele.army.mil
Subject: TEAD IDW Report for IDW61

Hello,

You will find attached the reports for IDW61. Please contact me if you have any questions or comments.

Thank you,

Amanda M. Evans
Chemist
parsons
406 West South Jordan Parkway, Suite 300
South Jordan, UT 84095
(801)553-3366
(801)572-9069 Fax

<<AME_idw61.pdf>>

SEVERN TRENT STL

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605

Tel: 916 373 5600 Fax: 916 372 1059
www.stl-inc.com

August 29, 2005

STL SACRAMENTO PROJECT NUMBER: G5H240240
PO/CONTRACT: 744139-30012

Jan Barbas
Parsons
406 West South Jordan Parkway
Suite 300
South Jordan, UT 84095

Dear Mr. Barbas,

This report contains the analytical results for the sample received under chain of custody by STL Sacramento on August 24, 2005. This sample is associated with your Tooelle IDW project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

Preliminary results were sent via e-mail on August 29, 2005.

If you have any questions, please feel free to call me at (916) 374-4427.

Sincerely,

Nilo Ligi
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G5H240240

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G5H240240

General Comments

Sample: 1

Sample was received in good condition at STL Sacramento at 4 degrees C.

Water, SW 8260B, Volatile Organics

Sample(s): 1

Sample was analysed by method SW 8260B, gas chromatography/mass spectrometry (GCMS) analysis. All QA/QC criteria were met except as noted below.

Sample(s): 1

Insufficient volume was available for MS/MSD. An LCS/DCS was prepared instead.

There were no anomalies associated with this project.

SEVERN TRENT STL

ACCREDITED IN ACCORDANCE WITH nelac

STL Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	Oregon*	CA 200005
Arizona	AZ0616	Pennsylvania	68-1272
Arkansas	04-067-0	South Carolina	87014002
California*	01119CA	Texas	TX 270-2004A
Colorado	NA	Utah*	QUAN1
Connecticut	PH-0691	Virginia	00178
Florida*	E87570	Washington	C087
Georgia	960	West Virginia	9930C, 334
Hawaii	NA	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613
New York*	11666		

*NELAP accredited. A more detailed parameter list is available upon request. Update 1/27/05

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary
G5H240240

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
HH53T	1	IDW61	8/23/2005 02:05 PM	8/24/2005 09:05 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

CHAIN OF CUSTODY

PARSONS

COC ID: 1022

Project Name:	Tooele Industrial Area	**Contractor:**	Parsons-SLC
Project Manager:	Ed Staes	**Installation:**	TEAD
Sample Coordinator:	Kurt Alloway	**Sample Program:**	

Parsons Point of Contact: Jan Barbas
406 W. South Jordan Parkway
Suite 300
South Jordan, Utah 84095
(801) 572-5999 FAX (801) 572-9069

Site ID	Location ID	Sample ID	Matrix	Method	Type	Sample No.	Log Date	Log Time	Logged By	Beg. Depth	End. Depth	Total Conts.
	IDW61	IDW61	WW	G	N	1	23AUG05	1405	KGA	—	—	3

Analysis	Lab	Cooler	No. Conts	AB Lot	EB Lot	TB Lot
VOC	SVLS	1	3			

Remarks: PARSN20520801

5 DAY TURN-AROUND REQUESTED

OV

Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
	23AUG05 / 1500		8/24/05 1005

To:STL Laboratories, 880 Riverside Pkwy, W. Sacramento, CA, 95605 (916) 373-5600

Thursday, August 18, 2005

SEVERN TRENT STL

LOT RECEIPT CHECKLIST
STL Sacramento

CLIENT Parsons PM NL LOG # 34227

LOT# (QUANTIMS ID) G5H240240 QUOTE# 62837 LOCATION VB

	Initials	Date
DATE RECEIVED 8/24/05 TIME RECEIVED 0905	CN	8/24/05

DELIVERED BY ☒ FEDEX ☐ CA OVERNIGHT ☐ CLIENT
☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL
☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS
☐ STL COURIER ☐ COURIERS ON DEMAND
☐ OTHER

CUSTODY SEAL STATUS ☒ INTACT ☐ BROKEN ☐ N/A

CUSTODY SEAL #(S) See 1

SHIPPPING CONTAINER(S) ☒ STL ☐ CLIENT ☐ N/A

TEMPERTURE RECORD (IN °C) IR 1 ☒ 3 ☐ ☐ OTHER _____

COC #(S) N/A

TEMPERATURE BLANK Observed: N/A Corrected: N/A

SAMPLE TEMPERATURE

Observed: 5 5 3 Average: 4 Corrected Average: 4

COLLECTOR'S NAME: ☐ Verified from COC ☒ Not on COC

pH MEASURED ☐ YES ☐ ANOMALY ☒ N/A

LABELED BY.....

LABELS CHECKED BY.....

PEER REVIEW _____ ☒ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING
WETCHEM ☒ N/A
VOA-ENCORES ☒ N/A

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☒ N/A

☒ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A

☐ Clouseau ☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☒ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED

Notes: _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤ 4°C.

Wastewater Analytical Results

Parsons Corporation

Client Sample ID: IDW61

GC/MS Volatiles

Lot-Sample #...: G5H240240-001 **Work Order #...:** HH53T1AA **Matrix.....:** WATER
Date Sampled...: 08/23/05 **Date Received..:** 08/24/05
Prep Date.....: 08/25/05 **Analysis Date..:** 08/25/05
Prep Batch #...: 5238494
Dilution Factor: 1 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.13
Carbon tetrachloride	ND	1.0	ug/L	0.15
Chloroethane	ND	1.0	ug/L	0.34
Chloroform	**0.13 J**	**1.0**	**ug/L**	**0.12**
1,1-Dichloroethane	ND	1.0	ug/L	0.10
1,2-Dichloroethane	ND	1.0	ug/L	0.22
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.10
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.11
1,1-Dichloroethene	ND	1.0	ug/L	0.36
1,2-Dichloropropane	ND	1.0	ug/L	0.15
Ethylbenzene	ND	1.0	ug/L	0.27
Methylene chloride	ND	2.0	ug/L	0.35
Naphthalene	**0.31 J**	**1.0**	**ug/L**	**0.15**
Tetrachloroethene	ND	1.0	ug/L	0.38
Toluene	**0.44 J**	**1.0**	**ug/L**	**0.25**
1,1,1-Trichloroethane	ND	1.0	ug/L	0.41
1,1,2-Trichloroethane	ND	1.0	ug/L	0.31
Trichloroethene	**48**	**1.0**	**ug/L**	**0.31**
Vinyl chloride	ND	1.0	ug/L	0.12
m-Xylene & p-Xylene	ND	1.0	ug/L	0.18
o-Xylene	ND	1.0	ug/L	0.10

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	96	(70 - 130)
1,2-Dichloroethane-d4	111	(70 - 130)
Toluene-d8	105	(70 - 130)
Dibromofluoromethane	109	(70 - 130)

NOTE(S):

J Estimated result. Result is less than RL.

QC DATA ASSOCIATION SUMMARY

G5H240240

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8260B		5238494	

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: G5H240240 **Work Order #...:** HJDWM1AA **Matrix.....:** WATER
MB Lot-Sample #: G5H260000-494

Prep Date.....: 08/25/05
Analysis Date..: 08/25/05 **Prep Batch #...:** 5238494
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methylene chloride	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	1.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	96	(70 - 130)
1,2-Dichloroethane-d4	112	(70 - 130)
Toluene-d8	103	(70 - 130)
Dibromofluoromethane	108	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: G5H240240 **Work Order #...:** HJDWM1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5H260000-494 HJDWM1AD-LCSD
Prep Date.....: 08/25/05 **Analysis Date..:** 08/25/05
Prep Batch #...: 5238494
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Chlorobenzene	**20.0**	**19.4**	**ug/L**	**97**		**SW846 8260B**
	20.0	**17.9**	**ug/L**	**90**	**8.0**	**SW846 8260B**
Benzene	**20.0**	**19.3**	**ug/L**	**96**		**SW846 8260B**
	20.0	**17.9**	**ug/L**	**90**	**7.2**	**SW846 8260B**
1,1-Dichloroethene	**20.0**	**20.1**	**ug/L**	**101**		**SW846 8260B**
	20.0	**17.9**	**ug/L**	**90**	**11**	**SW846 8260B**
Toluene	**20.0**	**18.9**	**ug/L**	**94**		**SW846 8260B**
	20.0	**17.5**	**ug/L**	**88**	**7.4**	**SW846 8260B**
Trichloroethene	**20.0**	**18.9**	**ug/L**	**95**		**SW846 8260B**
	20.0	**17.4**	**ug/L**	**87**	**8.4**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	106	(70 - 130)
	109	(70 - 130)
Toluene-d8	103	(70 - 130)
	106	(70 - 130)
Dibromofluoromethane	105	(70 - 130)
	106	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: G5H240240 **Work Order #...:** HJDWM1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: G5H260000-494 HJDWM1AD-LCSD
Prep Date.....: 08/25/05 **Analysis Date..:** 08/25/05
Prep Batch #...: 5238494
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Chlorobenzene	**97**	**(80 - 120)**			**SW846 8260B**
	90	**(80 - 120)**	**8.0**	**(0-30)**	**SW846 8260B**
Benzene	**96**	**(80 - 120)**			**SW846 8260B**
	90	**(80 - 120)**	**7.2**	**(0-30)**	**SW846 8260B**
1,1-Dichloroethene	**101**	**(80 - 120)**			**SW846 8260B**
	90	**(80 - 120)**	**11**	**(0-30)**	**SW846 8260B**
Toluene	**94**	**(80 - 120)**			**SW846 8260B**
	88	**(80 - 120)**	**7.4**	**(0-30)**	**SW846 8260B**
Trichloroethene	**95**	**(80 - 120)**			**SW846 8260B**
	87	**(80 - 120)**	**8.4**	**(0-30)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	99	(70 - 130)
	97	(70 - 130)
1,2-Dichloroethane-d4	106	(70 - 130)
	109	(70 - 130)
Toluene-d8	103	(70 - 130)
	106	(70 - 130)
Dibromofluoromethane	105	(70 - 130)
	106	(70 - 130)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Waste Material Profile, Hazardous Waste Manifest

WASTE MATERIAL PROFILE SHEET

Clean Harbors Profile No. CH91899B

A. GENERAL INFORMATION

GENERATOR EPA ID # *UT3213820894*
GENERATOR CODE (Assigned by Clean Harbors) *TO0469*
ADDRESS *Tooele Army Depot*

GENERATOR PROFILE No. **CH91899B**
GENERATOR NAME *Tooele Army Depot*
CITY *Tooele* STATE *UT* ZIP *84074*
PHONE:

CUSTOMER CODE (Assigned by Clean Harbors) *PAR1392*
ADDRESS *406 W South Jordan Parkway Suite 300*

CUSTOMER NAME: *Parsons Engineering Science In*
CITY *South Jordan* STATE *UT* ZIP *84095*

B. WASTE DESCRIPTION

WASTE DESCRIPTION: *PURGE AND DECON WATER*

PROCESS GENERATING WASTE (Please provide detailed description of process generating waste):
DRILLING AND PURGEING WELLS

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- ☑ LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
  - % FREE LIQUID
  - % SETTLED SOLID
  - % TOTAL SUSPENDED SOLI
- SLUDGE
- GAS/AEROSOL

NUMBER OF PHASES/LAYERS
☑ 1 2 3
% BY VOLUME (Approx.)
TOP
MIDDLE
BOTTOM

VISCOSITY (If liquid present)
☑ 1 - 100 (e.g. WATER)
101 - 500 (e.g. MOTOR OIL)
501 - 10,000 (e.g. MOLASSES)
> 10,000

COLOR
CLEAR

ODOR
☑ NONE
MILD
STRONG
Describe:

BOILING POINT
<= 95 °F
> 95 °F
101 - 129 °F
☑ >= 130 °F

MELTING POINT
< 140 °F
140-200 °F
> 200 °F

TOTAL ORGANIC CARBON
☑ <= 1%
1-9%
>= 10%

FLASH POINT
< 73 °F
73 - 100 °F
101 -140 °F
141 -200 °F
☑ > 200 °F
Actual:

pH
<= 2
2.1 - 6.9
☑ 7 (Neutral)
7.1 - 12.4
>= 12.5
Actual:

SPECIFIC GRAVITY
< 0.8 (e.g. Gasoline)
0.8-1.0 (e.g. Ethanol)
☑ 1.0 (e.g. Water)
1.0-1.2 (e.g. Antifreeze)
> 1.2 (e.g. Methylene Chloride)

ASH
< 0.1
0.1 - 1.0
1.1 - 5.0
5.1 - 20.0
> 20
Unknown
Actual:

BTU/LB
☑ < 2,000
2,000-5,000
5,000-10,000
> 10,000
Actual

VAPOR PRESSURE (for liquids only) : mm Hg

D. COMPOSITION (List the complete composition of the waste, include any inert components and /or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

CHEMICAL	MIN - MAX	UOM
BENZENE	0.000 – 139.000	PPB
CARBON TETRACHLORIDE	0.000 – 56.000	PPB
CHLOROFORM	0.000 – 45.000	PPB
ETHYLBENZENE	0.000 – 56.000	PPB
NAPHTHALENE	0.000 – 58.000	PPB
TETRACHLOROETHANE	0.000 – 55.000	PPB
TOLUENE	0.000 – 79.000	PPB
TRICHLOROETHENE	0.000 – 53.000	PPB
WATER	99.000 – 100.000	%
Xylene (Mixed Isomers	0.000 – 319.000	PPB

CHEMICAL	MIN - MAX	UOM
— NO CODE		

ANY METAL OBJECTS PRESENT? YES ☑ NO
If yes include dimension

Clean Harbors Profile No. CH91899B

E. CONSTITUENTS -- Are these values based on testing or knowledge? ☐ Knowledge ☑ Testing

If constituent concentrations are base on analytical testing, analysis must be provided. If based on knowledge, basis of knowledge must be provided below.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D004	ARSENIC	5.0		
D005	BARIUM	100.0		
D006	CADMIUM	1.0		
D007	CHROMIUM	5.0		
D008	LEAD	5.0		
D009	MERCURY	0.2		
D010	SELENIUM	1.0		
D011	SILVER	5.0		

RCRA	VOLATILE COMPOUND	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D018	BENZENE	0.5		
D019	CARBON TETRACHLORIDE	0.5		
D021	CHLOROBENZENE	100.0		
D022	CHLOROFORM	6.0		
D028	1,2-DICHLOROETHANE	0.5		
D029	1,1-DICHLOROETHYLENE	0.7		
D035	METHYL ETHYL KETONE	200.0		
D039	TETRACHLOROETHYLENE	0.7		
D040	TRICHLOROETHYLENE	0.5		
D043	VINYL CHLORIDE	0.2		

RCRA	SEMI-VOLATILE COMPOUND	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D023	o-CRESOL	200.0		
D024	m-CRESOL	200.0		
D025	p-CRESOL	200.0		
D026	CRESOL (TOTAL)	200.0		
D027	1,4-DICHLOROBENZENE	7.5		
D030	2,4-DINITROTOLUENE	0.13		
D032	HEXACHLOROBENZENE	0.13		
D033	HEXACHLOROBUTADIENE	0.5		
D034	HEXACHLOROETHANE	3.0		
D036	NITROBENZENE	2.0		
D037	PENTACHLOROPHENOL	100.0		
D038	PYRIDINE	5.0		
D041	2,4,5-TRICHLOROPHENOL	400.0		
D042	2,4,6-TRICHLOROPHENOL	2.0		

RCRA	PESTICIDES AND HERBICIDE	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL ppm
D012	ENDRIN	0.02		
D013	LINDANE	0.4		
D014	METHOXYCHLOR	10.0		
D015	TOXAPHENE	0.5		
D016	2,4-D	10.0		
D017	2,4,5-TP (SILVEX)	1.0		
D020	CHLORDANE	0.03		
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008		

OTHER METALS	MIN	MAX	UOM
ALUMINUM			
ANTIMONY			
BERYLLIUM			
CALCIUM			
COPPER			
MAGNESIUM			
MOLYBDENUM			
NICKEL			
POTASSIUM			
SILICON			
SODIUM			
THALLIUM			
TIN			
VANADIUM			
ZINC			

NON-METALS	MIN	MAX	UOM
BROMINE			
CHLORINE			
FLUORINE			
IODINE			
SULFUR			

OTHER NON-METALS	MIN	MAX	UOM
AMMONIA			
REACTIVE SULFIDE			
CYANIDE TOTAL			
CYANIDE AMENABLE			
CYANIDE REACTIVE			

OTHER CHEMICALS	MIN	MAX	UOM
PHENOL			
Total Petroleum Hydrocarbons			

OTHER

HOCs

☐ NONE
☑ < 1000 PPM
☐ >= 1000 PPM

PCBs

☑ NONE
☐ <50 PPM
☐ >= 50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

YES ☑ NO

ADDITIONAL HAZARDS

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

YES ☑ NO (If yes, explain)

ASBESTOS	INFECTIOUS, PATHOGENIC, OR ETIOLOGICAL AGENT	REDUCING AGENT
DEA REGULATED SUBSTANCES	OXIDIZER	SHOCK SENSITIVE
DIOXIN	OSHA REGULATED CARCINOGENS	SPONTANEOUSLY IGNITES WITH AIR
EXPLOSIVE	PESTICIDE	THERMALLY SENSITIVE
HERBICIDE	POLYMERIZABLE	WATER REACTIVE
FUMING / SMOKING WASTE	RADIOACTIVE	
NONE OF THE ABOVE		

Clean Harbors Profile No. CH91899B

F. REGULATORY STATUS

☑ YES NO USEPA HAZARDOUS WASTE?
F001 F002 F003 F005

YES ☑ NO DO ANY STATE WASTE CODES APPLY?

YES ☑ NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?
LDR CATEGORY:
VARIANCE INFO:

☑ YES NO IS THIS A WASTEWATER PER 40 CFR PART 268.2?

YES ☑ NO IF ANY WASTE CODES D001, D002, D003 (OTHER THAN REACTIVE CYANIDE OR REACTIVE SULFIDE), D004-D011, D012-D017 NON-WASTEWATERS, OR D018-D043 APPLY, ARE ANY UNDERLYING HAZARDOUS (UHCs) PRESENT ABOVE UNIVERSAL TREATMENT

YES ☑ NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

YES ☑ NO IS THIS WASTE SUBJECT TO CATEGORICAL PRETREATMENT DISCHARGE STANDARDS?
IF YES, SPECIFY POINT SOURCE CATEGORY LISTED IN 40 CFR PART 4

YES ☑ NO IS THIS WASTE REGULATED UNDER THE BENZENE NESHAP RULES? (IS THIS WASTE FROM A CHEMICAL MANUFACTURING, COKE BY-PRODUCT RECOVERY, OR PETROLEUM REFINERY PROCESS?)

YES ☑ NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?

YES ☑ NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?

☑ YES NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE GREATER THAN 77 KPa (11.2PSIA)?

YES ☑ NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE ?

G. D.O.T INFORMATION: (Include proper shipping name, hazard class and ID number).
US D.O.T. DESCRIPTION: *Hazardous waste, liquid, n.o.s., (TRICHLOROETHENE, TETRACHLOROETHENE) , 9, NA3082, PG III*

H. TRANSPORTATION REQUIREMENTS
ESTIMATED SHIPMENT FREQUENCY: ONE TIME WEEKLY MONTHLY QUARTERLY YEARLY ☑ OTHER *VARIES*
IF BULK LIQUID OR BULK SOLID PLEASE INICATE THE EXPECTED NUMBER OF LOADS PER SHIPPING FREQUENCY

CONTAINERIZED	☑ BULK LIQUID	BULK SOLID
CONTAINERS/SHIPMENT	GALLONS/SHIPMENT: GAL.	SHIPMENT UOM: TON YARD
STORAGE CAPACITY:	FROM TANKS: TANK SIZE GAL.	PER SHIPMENT: 0.00 MIN 0.00MAX
CONTAINER TYPE:	FROM DRUMS	STORAGE CAPACI TON/YD
CUBIC YARD BOX	VEHICLE TYPE:	VEHICLE TYPE:
PALLET	VAC TRUCK	DUMP TRAILER
TOTE TANK	☑ TANK TRUCK	ROLL OFF BOX
OTHER:	RAILROAD TANK CAR	INTERMODAL ROLLOFF BOX
DRUM SIZE:	CHECK COMPATIBLE STORAGE MATERIAL	CUSCO/VACTOR
CONTAINER MATERIAL:	☑ STEEL / STAINLESS STEEL	OTHER
STEEL	RUBBER LINED / FIBERGLASS LINED	
FIBER	DERAKANE	
PLASTIC	OTHER	
OTHER		

I. SPECIAL REQUEST
SPECIFIC DISPOSAL RESTRICTIONS OR REQUESTS: *LANDFILL GRASSY MOUNTAIN / MEETS TREATMENT STANDARDS*
SPECIAL WASTE HANDLING REQUIREMENTS
OTHER COMMENTS OR REQUESTS:

J. BIENNIAL / ANNUAL REPORTING INFORMATION
SIC CODE *9711* SOURCE CODE *A63* FORM CODE *B101* ORIGIN CODE *NA*

K. SAMPLE STATUS

	YES	SAMPLED BY	DATE SAMPLED	WHERE SENT
REPRESENTATIVE SAMPLE HAS BEEN SUPPLIE	☑ NO			

GENERATORS CERTIFICATION

I here by certify that all information submitted in this and attached documents is correct to the best of my knowledge. I also certify that any samples submitted are representative of the actual waste. If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE	NAME (PRINT)	TITLE	DATE
Merle D Reynolds	Merle D Reynolds	Env Prof Spec	3/9/05

FOR CLEAN HARBORS USE ONLY
CHI REPRESENTATIVE COMPLETING PROFILE:_____

09100212
PFW/08/25/2005

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. UT3213820891 Manifest Document No. PS013 2. Page 1 of 1 Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address
Tooele Army Depot
ATTN: Dean Reynolds
Tooele Army Depot Environmental Office, SMTE-, DS-EO Building 6
Tooele, UT 84074
4. Generator's Phone (435) 833-3604

A. State Manifest Document Number
B. State Generator's ID Tooele Army Depot Tooele, UT 84074

5. Transporter 1 Company Name
MP Environmental Services
6. US EPA ID Number UTD980629247
C. State Transporter's ID
D. Transporter's Phone (801) 393-1151

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Clean Harbors Grassy Mountain
3 Miles East 7 Miles North of Knolls
Clive, UT, 84029
10. US EPA ID Number UTD981301718
G. State Facility's ID
H. Facility's Phone (801) 323-8666

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. HAZARDOUS WASTE, LIQUID, N.O.S., (TRICHLOROETHENE, TETRACHLOROETHENE), 9, NA3082, PG III	X				T	F001 F002 F003 F005
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
EMERGENCY PHONE TOOELE ARMY DEPOT FIRE DEPT (435) 833-2115

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name [illegible] Signature [illegible] Month 09 Day 20 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name Signature Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name Signature Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name Signature Month Day Year

I. Mark Francis has the appropriate permits for and has accepted the waste this generator is shipping.

FILE COPY OR STATE COPY

CleanHarbors
ENVIRONMENTAL SERVICES, INC.

Land Disposal Restriction Notification Form

Date: 09 / 14 / 2005

MANIFEST INFORMATION

Generator: Tooele Army Depot
Address: Tooele Army Depot
Tooele, UT 84074
EPA ID#: UT3213820894

Manifest No

Sales Order No: D91022123
Manifest Document No: P5013

LINE ITEM INFORMATION

Line Item:	Page No:	Profile No:	Treatability Group:	LDR Disposal Category:
11a	1	CH91899B	WASTEWATER	2 : This is subject to LDR.

EPA Waste Codes
F001 F002 F003 F005

EPA Waste Subcategory
NONE

LDR Chemical Data

Chemical	Underlying Hazardous Constituents	Constituents of Concern	Contaminants Subject to Treatment
BENZENE	N	Y	N
CHLOROFORM	N	Y	N
ETHYL BENZENE	N	Y	N
TETRACHLOROETHYLENE	N	Y	N
TOLUENE	N	Y	N
TRICHLOROETHYLENE	N	Y	N

Certification

Applies to Manifest Line Items

Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268. **11a**

Waste analysis data, where available, is attached

Signature: Larry McFarland
Print Name: Larry McFarland

Title: Program Manager
Date: 9-20-05